THE IRON AGE

New York, November 7, 1918

ESTABLISHED 1855 VOL. 102: No. 19

Tool Department of Winchester Works*

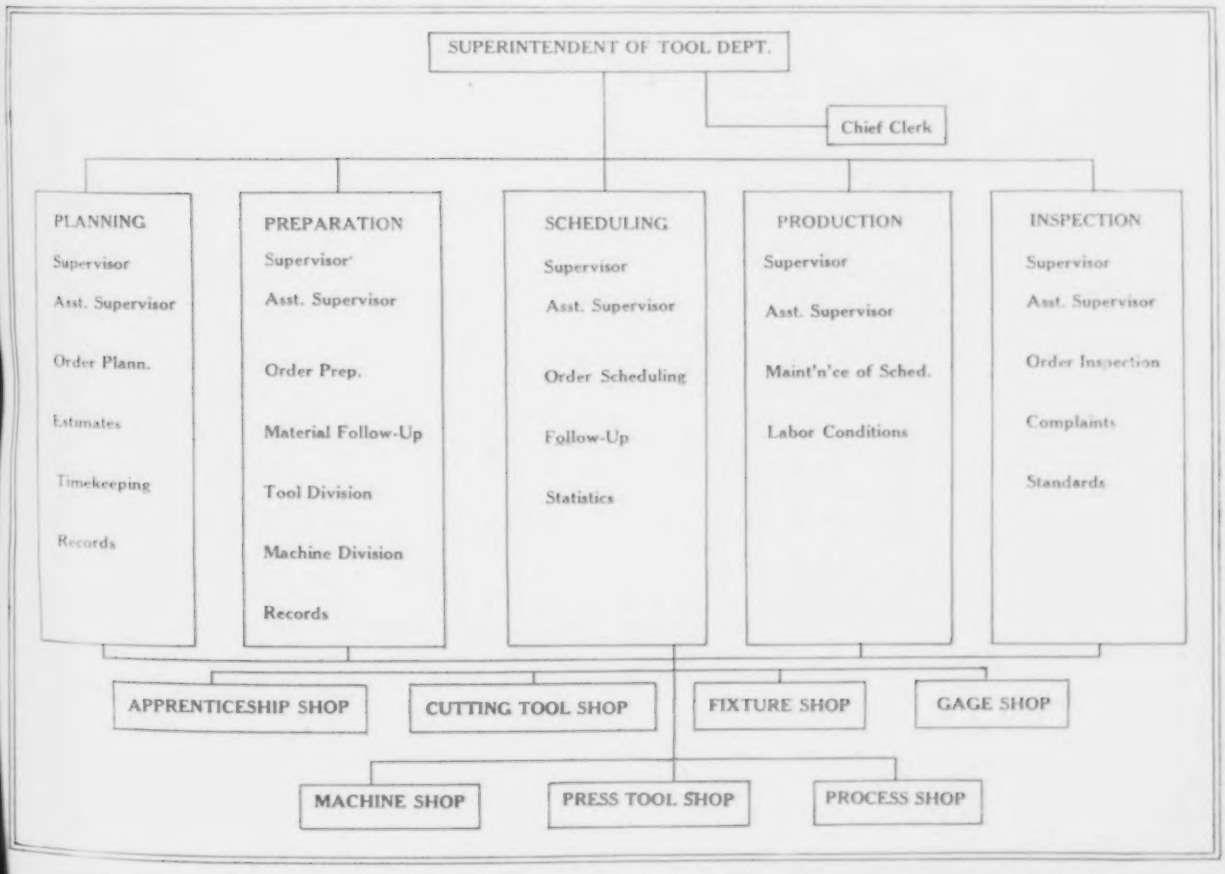
Virtually on a Factory Production Basis, Workers Being Trained for a Single Type Operation—The Preparation Section's Important Functions

THE tool department of the Winchester Repeating Arms Co., New Haven, Conn., is responsible for the conduct of what is virtually a large tool factory. Yet it is like all tool departments, primarily a service department, and it is obliged at times to pile up its own expense to keep the production departments going. Its largest task is to so co-ordinate its work with that of the production departments that emergency work of any kind is kept at the lowest possible minimum.

Much of the production is on a true factory basis rather than a jobbing basis, and the product is turned into stores for future reissue. In stores, the product may be mingled with other similar tools which have been made on contract by other manufacturers, as it frequently happens that the limitations in labor supply or in machine equipment make it advisable to sub-contract some of the tools, jigs, fixtures or gages needed. A conception of the volume of the product of the tool factory may be gained by the statement that the production of press tools (punches and dies) exceeds 100,000 a month and of cutting tools (cutters, sets of mills, reamers, drills, splining tools, forming tools, etc.) the production exceeds 30,000 a month.

The tool department maintains these shops: Press tool, cutting tool, jig and fixture, gage, machine, apprentice, training, and preparation. The total number of employees in these shops is about 1800. The work is much sub-divided in order to utilize the greatest number of operatives, most of the trained toolmakers and machinists being used in assembly and erection work. Only such sub-

*Ninth article of a series dealing with the Winchester Repeating Arms Co.'s plant and methods. The present article is the first of three devoted to the Tool Department.



GENERAL SCHEME OF ORGANIZATION OF TOOL DEPARTMENT OF THE WINCHESTER REPEATING ARMS CO.

As Laid Out for the Company's Use, the Names of the Heads and Sub-Heads of the Various Sections Are Included and in the Squares for Each Shop, the Names of the Foreman and Overseer for Each Section Are Given

Outline of the Duties of the Different Sections

division of work, with the use of specialist and quickly trained operators, is possible under the existing conditions of shortage of thoroughly trained men. The standardization upon a comparatively few war products with the consequent increase in the size of lots of tools, together with the repetitive operations thereon, makes it possible to train operators to perform a single type of operation and brings about a high degree of skill in remarkably short time. The premium system is in vogue on most operations and in some of the shops as high as 80 or 90 per cent of the work is done on task times. Time studies have not been wholly completed, but estimated times based upon previously established times for successive steps in the operation are employed successfully where time studies have not been made. Before the establishment of the present tool department, a considerable part of the work on the tools was done in special shops, in the shop tool cribs, or by the adjusters of the cartridge and gun departments, but to-day from 90 to 95 per cent of the work on press tools is done in the press tool shop and the cutting tool shop has nearly as good a record.

Results of Standardization

The ideal of the old type of tool room which employed skilled toolmakers exclusively was to build a little machine shop around each toolmaker, or at least a small group of toolmakers. In the large tool shops, of which the Winchester shops are good examples, all the machines of a general type are located together and the work moves forward from operation to operation much as it does in any well-managed production department. This factory scale production results not only in a larger output per man, but also in a degree of standardization that is difficult of attainment under the older arrangement. By intensive study and close cooperation, the supervisors in the tool department and the cartridge department have greatly reduced the number of sizes of stock which must be carried in stores for punches and dies with a great reduction in the inventory; have made improvements in the working blue prints that lead to simplified and standardized tools; have extended the use of devices to secure concentricity of tools; and have bettered the inspection methods; the combination of these efforts resulting in a saving of the time needed for tool adjustment and for finishing work on tools in the cartridge shops, also in a gain in the life of the tools, and thus in the amount of tool consumption per unit of cartridge output. Where 3500 tools were formerly needed to produce 1,000,000 cartridges, less than 2100 are now needed. The longer life and better quality of the tools have been real factors in increasing the output of cartridges per machine and reducing their cost to the Government. Equally interesting results have been secured in the cutting tool shop by studies of steels, heat treatment and machining processes, the development of better cutting tools being directly reflected in the increased production of gun parts and the diminution of scrap.

Central Planning Office

Control of the production of the various tool shops rests in the central office, which is located as a part of the general offices. It operates as a large central planning office through which the supervisors of planning, preparation, scheduling, production and inspection control the functions for which they are responsible. The planning section prepares estimates and detailed material sheets so that the shops will receive the proper specifications for the work to be done, and sees that the respective shops get the work that they are most capable of handling. The preparation section orders and sends to the shops the necessary material and also orders or procures the special tools, gages, fixtures, etc., that may be necessary. It is held responsible for the up-keep of the shop tool cribs, for the maintenance of special tools generally used, of small quantities of shop stores (screws, bolts, nuts, etc.), and of machinery in the shops. The scheduling section determines the start and finish dates for the individual jobs and checks the balance of work in the various shops to ascertain necessary increases or decreases in the working force. It also maintains an inquiry bureau to answer questions regarding the status of the work and is responsible for the cancellation of orders.

The production section is responsible for production and discipline, for the entire handling of emergency work, has supervision of the maintenance of premium rates, feeds and speeds, and is charged with the maintenance of the scheduled starting and finishing times on the jobs. The inspection section is responsible for the quality of the work. The entire administrative staff in the central office is engaged in an effort to prevent the shops from getting into an unstable condition

caused by lack of work, overload of work, incorrect specifications, improper or insufficient tools, gages and fixtures, delays in receipt of material, performing work in the wrong sequence, insufficient premium rates, improper speeds and feeds, poor quality of work, lack of machinery up-keep, etc.

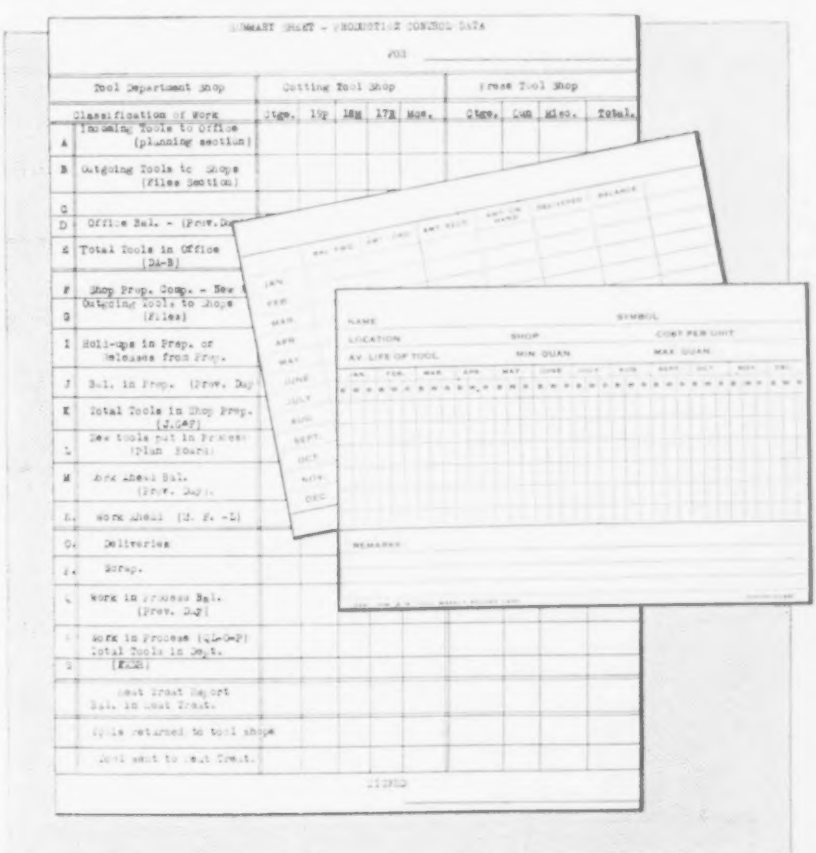
The Part Preparation Plays

The preparation section plays a highly important part in the scheme of production of the tool shops, so much so that it has just been provided with a shop of its own in which it makes tools to make production tools. Its function is all that its name implies; that is, to prepare all machinery, tools, fixtures, gages, and other material for the proper execution of all orders that are placed with the tool department. The staff of the preparation supervisor in the central office comprises an assistant supervisor, a follow-up man for each shop or group of shops in the department, a tool inventory recorder, a man assigned to the preparation of special tools, a follow-up man for all castings and forgings, and a clerk to handle the plan-of-material sheets that are received from the planning section. The preparation overseers and their assistants in the shops are also under the supervision of the preparation supervisor. The overseer is sometimes assisted by an assistant overseer, a clerk who is responsible for the receipt and issue of all material and equipment coming into the shop, one or more tool crib attendants who are responsible for the proper issuance and maintenance of tools and other equipment kept in the tool crib, an errand boy and other help when necessary.

The work of the preparation section has its origin in the plan-of-material sheets. A duplicate of the plan-of-material sheet is sent to the preparation overseer in the shop affected and in the central office a requisition is made out in duplicate for each item shown on the plan. All steel requisitions are sent to the steel basis file, where the weights are affixed and the sizes of stock called for are checked against the file records. If the issues are found to be correct, the requisitions are returned to the preparation section and forwarded by it to the central material planning division for apportionment. In case it is necessary to have the material purchased or manufactured, the order number under which the material is being purchased or manufactured, together with the probable date of delivery, is sent to the preparation section and this information is added to the plan-of-material sheet in the space provided. The requisition is held by the central material planning division to await the arrival of the stock. The follow-up man affected receives all the requisitions after apportionment and arranges with the stores department for the delivery to the shops of the material, according to the schedule dates. If any material is not delivered on the promised delivery date, the follow-up man ascertains the reason for the hold-up and steps are taken by him to locate the stock if possible and hurry its arrival or to secure a new delivery date. Duplicate copies of the requisitions are sent to the shop receiving clerk to await the arrival of the material. When the material is delivered, he stamps the duplicate copy "Goods Received" and returns it to the central office. In this manner a parallel record is kept in the shop office and in the central office of the status of the preparation of any order.

When it is not possible for the preparation section to obtain the exact size or kind of steel or other material called for by the planning section, the follow-up man ascertains through the man who planned the order if a substitution is acceptable. The preparation section maintains a separate follow-up on all orders calling for castings or forgings. Forgings are made through a sub-order placed on the blacksmith shop, which is a part of the maintenance department. Castings are not made by the company, but a storehouse is maintained under the supervision of the preparation section in which are kept all standard patterns. When a casting is ordered, the pattern is checked with the blueprint and forwarded to the foundry and the follow-up man is charged with the responsibility for delivery of the completed casting.

Upon the receipt in the shop of a duplicate copy of the plan of material, the preparation overseer of that shop makes an analysis of the work to be done and if gages, models, or special tools are required, he immediately places an order to secure them. All orders for tools necessary to make a production tool are placed through the central office by a man assigned to that duty. The special tool preparation man maintains a record of each production tool, showing the tools that are needed to make the tool. This record also shows the average life of the



A Record of Tool Production Is Kept on the Summary Sheet. A weekly record of tools used in the production of tools is kept on the ruled card. On the front of the card, the letter B stands for broken, W for worn out and R for rejected

tool and the maximum and minimum quantity to be kept on hand. By means of a bi-weekly inventory, orders are placed for new tools when the amount on hand reaches the minimum called for by this record. The tool inventory recorder maintains all records of standard tools kept in the various tool cribs. All broken, worn-out or rejected tools are checked by him against his records. In this manner it is possible to check all the tools in any crib at any time of the year. The responsibility for the proper upkeep of machinery and equipment lies largely with the preparation overseer in each shop, who places orders for repairs through the central office.

Office Progress Records

The production departments initiate tool orders by sending a manufacturing order to the tool department. From the central planning office of the tool department, the manufacturing order and blueprint are sent to the progress clerk in the proper shop office. A progress record, A, made in triplicate, is employed to keep track of the progress of the order through the shop office. The manufacturing order and blueprint are placed in a large envelope and the "circulating" copy of the progress record is pasted on the envelope. The "master" copy is filed by order number and the "tickler" copy is clipped to the envelope.

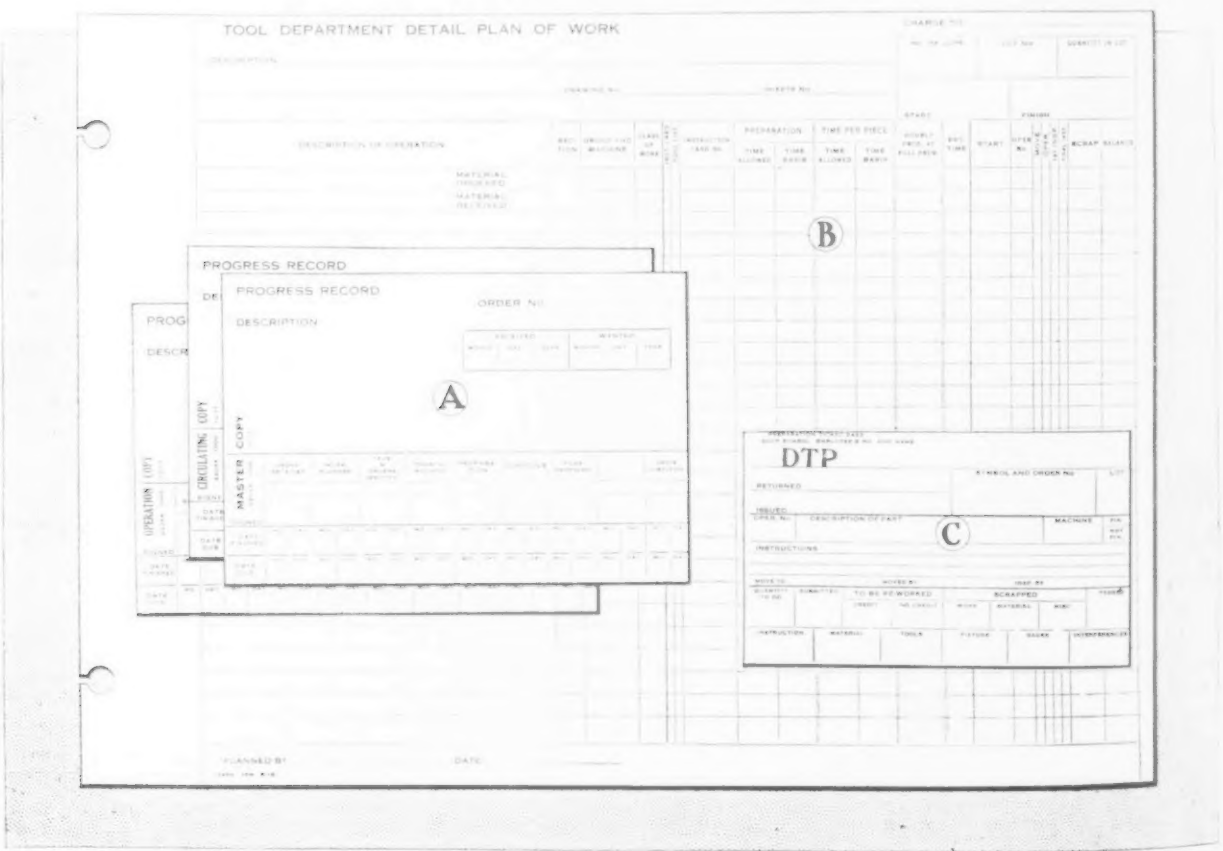
The envelope is placed in the preparation section of the progress box and a check line is drawn half-way through the preparation space on the master copy of the progress record. When the envelope is sent to the preparation man, he files it while awaiting the stock. When the material arrives he stamps the stub of the stores tag with the date to show the receipt of the material. He makes out a tool list, which is filed separately. When he returns the envelope to the progress clerk, he signs in the designated space. The progress clerk places the envelope in the proper section for the next operation (usually planning) and again attaches the tickler copy of the progress record. He also completes the drawing of the check line through the preparation space on the master copy and draws a line half-way through the space for the work next to be done.

The planner makes out a detailed plan of operations, B, filling in the number of machining operations required in their proper sequence. He also specifies the group of machines on which the work should be done and the time required. Where time studies have not been made, he puts in an estimated time for each operation. He also notes when special tools are needed to make a production tool and specifies all materials not otherwise provided for.

The envelope then goes to the rate setter. A typist writes the operation tickets, C, and the identification tags, and such other working papers as may be required are prepared. A set of operation tickets is made out for each operation. These are made in triplicate and the copies are called, operation, sub-overseer and preparation. The scheduler then determines the date on which the job should be finished and writes this date on the face of the circulating copy of the progress record, which is pasted on the face of the envelope.

The envelope, operation tickets, etc., are then sent to the clerks, called assigners, operating the schedule boards. By determining from the plan of work sheet the total time required for all operations, adding one day after each operation for inspection and two days for heat treating when necessary, he is able to ascertain the time when the first operation should be started. The assigner then looks over on the schedule boards the group of machines designated by the planner and schedules the job ahead of that machine in the group which will come nearest to meeting the starting date.

The schedule boards are of the type now becoming quite familiar, which employ wooden blocks on narrow ledges to measure the number of ma-



A Record of the Progress of Each Order Is Kept on Forms A; a Detailed Plan of the Operation on B. A set of operation tickets, C, are made out for each operation

chine hours scheduled against each machine. A block 1 in. long represents ten hours of time and the length of the row of blocks when placed close against one another graphically shows the amount of work ahead of each machine. Each ledge or shelf represents a single machine unit. An extra ledge at the top of the board holds blocks to represent each day of the month. The date block at the left end of the row carries the current date, the block for the previous day being placed at the other end of the row to maintain the sequence. By means of this moving calendar, it can be quickly ascertained on what date any job on the board is scheduled to be started. On the blocks is pasted a block schedule ticket which carries the time required to perform the operation, the order number, drawing number, lot number and machine symbol. The scheduled starting date is put on this ticket with a red pencil. A yellow pin in the block designates work ahead of the machine, but not ready to be started. Other colored pins represent various kinds of interferences. The assigner puts the scheduled starting date on the plan of work opposite the proper operation and puts the block in its assigned place on the board. The other operations on the plan of work are similarly handled.

When the assigner has scheduled each operation he puts the starting date and finishing date in the space provided at the top of the plan of work. He next clips together the identification tag, the drawing and the first operation tickets and sends them to the preparation section for checking of the tools and approval of the preparation copy of the operation ticket. After the preparation section has returned the working papers, the assigner removes the yellow pin from the block on the schedule board and places the envelope with the attached papers in a machine board having three pockets for each machine. The first pocket is for work ready for the machine, and the envelopes are filed in the same order as the blocks on the schedule board. When, at the specified starting time, the work is assigned to the machine, the operation and preparation copies of the work tickets are placed in the second, or work ready, pocket and the sub-overseer's ticket is placed in a floor control board at the sub-overseer's station. The drawing also goes to the sub-overseer. When an operator requires a new work ticket, he goes to the sub-overseer and is given the ticket which the control board shows is the next job assigned to his machine. He also is given the drawing. The sub-overseer thereupon destroys his ticket of the finished job.

The operator then turns in to the office the operation card of the finished job. The clerk takes from the work ready pocket the operation and preparation work tickets for the new job, stamps the date in the proper space of the operation ticket of the finished job and also in the "issued" space of the two tickets for the new job. He takes the preparation ticket of the finished job out of the third or "work in process" pocket and puts in its place the preparation ticket of the new job. He then gives the operation ticket of the new job and the preparation ticket of the finished job to the operator. The operator turns his finished work and the preparation ticket for it over to the inspector. He then presents the operation ticket for the new job to the stock room and receives the stock for the new job.

Shipbuilders' Wages Raised

WASHINGTON, Nov. 4. — The Shipbuilding Labor Adjustment Board, better known as the Macy Board, has issued the details of the long expected wage increases for the shipbuilding yards of the country. The increases total approximately $9,000,000 a month. The basic rate for both the Atlantic and Pacific coasts, is fixed at 80c. an hour, which is an increase of practically 15c. an hour over the existing Pacific coast rates and 10c. an hour over the Atlantic coast rates. The increase is based, according to the statement, on the ascertained rise in the cost of living throughout the country. If this had been followed exactly, the basic rate on the Pacific coast would have been made 83¾c. an hour and on the Atlantic coast 80½c., but the board averaged it at 80c.

The new scales enumerate every class of workmen and start with a minimum rate of 36c. an hour, which is to be paid to the passer boys at all yards and to the "common" laborers at the South Atlantic and Gulf yards, with 46c. an hour to "laborers." The highest rate is $1.48 an hour for the heavy hammer and machine forgers. Although the new rates are all increases, they will be a disappointment to the shipyard workers who demanded a basic rate of $1 an hour. The rates for the Atlantic coast, Gulf, and Great Lakes shipyards, were made effective Oct. 1, while those for the Pacific coast are retroactive to Aug. 1, 1918.

According to the announcement of the Macy Commission the principal characteristic of the decision is that it establishes uniform national rates for practically all the skilled trades in the yards.

The Lakewood Engineering Co., Cleveland, announces the opening of its own offices in New York in the Trinity Building, 111 Broadway, with George S. Hedge as district manager. The company's specialties are construction plant and industrial haulage.

Ferromanganese Imports and Exports in August

Ferromanganese imports in August were 3743 gross tons, as compared with 3952 tons in July and with 2840 tons August, 1917. The August imports rank fourth for the year, those for June, May and July having been 5739 tons, 4138 tons and 3952 tons, respectively. The total imports for the first eight months of this year, ended Aug. 31, have been 26,169 tons, as compared with 35,473 tons for the same eight months in 1917, or 3271 tons per month, as contrasted with 4434 tons per month.

Exports in August were 284 tons, as against 351 tons in July, bringing the total for the first eight months to 3170 tons. The exports to Sept. 1 this year have been nearly three times those to Sept. 1, 1917, when they were 1082 tons.

Under a new plan adopted by the Cleveland Association of Credit Men, the various industries connected with this association have been divided into twelve groups, each with a chairman and executive committee. Each group will hold a monthly noon luncheon meeting. Clifford E. Pierce, Betz-Pierce Co., who is the first vice-president of the association, is chairman of the iron and steel group; T. W. Johnson, Chisholm-Moore Mfg. Co., is chairman of the machinery and tools group; Heber Outland, Cleveland Metal Products Co., is chairman of the hardware and builders' supply group; and Manley H. Chase, who is second vice-president of the association, is chairman of the automobile and auto parts group. The four groups are composed of 482 members.

The Abrams Brothers Iron Co., 4415 Trumbull Avenue, Cleveland, has been incorporated to take over the business of M. Abrams & Sons. Associated with them will be E. S. Edwards, formerly of the Velick Scrap Iron & Machinery Co., and recently New York district manager for the Stalnaker Steel Co.

September Iron and Steel Exports Smaller

Heavy Falling Off in Comparison with August—Caused by Greater Concentration of Steel Production on War Material

WASHINGTON, Nov. 5.—Figures of iron and steel exports for September, 1918, again reveal a decided downward tendncy. This is true both in comparison with the figures for Aug., 1918, and for Sept., 1917. It is likewise true both of tonnage figures for the heavier commodities and of the valuation figures for machinery.

This is largely the result of the heavy emphasis which has been laid by the War Industries Board upon the necessity for concentrating all our steel production on war output, most of which, of course, does not figure in the commerce statistics. That is why the exports in tonnage totals fell from 511,858 tons in Aug. 1918, to 473,066 tons in Sept., 1918. The figures for Sept., 1917, were 489,415 tons. For the nine months ended with Sept., 1918, the figures were 4,142,841 tons, against 4,525,871 tons in the corresponding months of 1917.

Pig-iron exports showed a slight recovery over the record-breaking low figures of Aug., 1918, rising from 26,028 tons to 34,494 tons. Exports of scrap, which had sunk to 71 tons in August, disappeared from the list entirely.

Exports of steel rails remained almost stationary—43,868 tons in Sept., 1918, against 42,542 tons in the preceding month. As in August, the largest share again went to France—a total of 17,936 tons. There is an interesting coincidence in the comparative figures for this commodity. In Sept., 1917, the lion's share of the steel-rail exports went to European Russia, and the amount was almost the same as that which has just been shipped to France, namely, 17,434 tons. But the French total was valued at $1,047,383, against the Russian valuation of $794,147 a year ago. Of the remaining share of the September exports of rails, 6441 tons went

Exports of Iron and Steel

	September		Nine Months	
	1917 Gross Tons	1918 Gross Tons	1917 Gross Tons	1918 Gross Tons
Pig iron	....	....	b377,694	
Ferromanganese	a57	234	a1,139	
Ferrosilicon	a1,116	86	a4,329	
All other pig iron	a43,114	34,174	a133,207	
Scrap	1,459	....	136,240	
Bar iron	3,099	5,821	39,561	
Wire rods	15,893	16,349	115,374	
Steel bars	47,577	44,895	470,778	
Billets, ingots, blooms, n.e.s.	148,932	135,450	1,478,610	
Bolts and nuts	2,317	3,003	265,362	
Hoops and bands	5,097	2,847	41,695	
Horseshoes	3,307	104	6,417	
Cut nails	604	247	3,020	
Wire nails	9,777	4,395	74,221	
Wood screws	a276	....	a856	
All other nails, including tacks	1,543	1,346	14,566	
Cast pipes and fittings	7,289	4,006	55,182	
Wrought pipes and fittings	12,592	7,016	98,177	
Radiators and cast-iron house-heating boilers	407	403	4,424	
Railroad spikes	2,605	937	15,412	
Steel rails	34,387	43,868	372,979	
Galvanized sheets and plates	7,064	5,734	65,634	
All other sheets and plates	4,927	4,454	44,302	
Steel plates	42,487	47,975	397,980	
Steel sheets	11,264	15,933	104,892	
Plates punched and shaped	a3,916	1,878	a6,960	
Structural iron and steel	21,156	22,545	222,468	
Tin and terne plates	11,596	19,629	128,056	
Barb wire	28,989	33,691	138,904	
All other wire	16,589	16,546	146,647	
Total	489,415	473,066	4,525,871	4,142,841

a Not separately enumerated prior to July 1, 1917.
b Six months ended June 30, 1917.

Exports of Machinery

	September		Nine Months	
	1917	1918	1917	1918
Adding machines	$197,264	$150,544	$1,688,667	$1,353,931
Air-compressing machinery	139,968	159,054	788,425	1,856,731
Brewers' machinery	1,803	7,850	96,899	91,629
Cash registers	49,497	83,973	668,322	517,432
Parts of	3,353	16,383	60,753	63,046
Concrete mixers	a24,062	39,777	a47,906	267,889
Cotton gins	4,726	6,110	69,155	83,451
Cream separators	31,883	41,656	467,976	573,113
Elevators and elevator machinery	270,588	196,166	1,671,392	1,448,636
Electric locomotives	33,081	26,365	353,372	98,621
Gas engines, stationary	84,811	42,979	663,965	371,829
Gasoline engines	2,598,347	3,410,942	17,881,778	28,171,921
Kerosene engines	a256,541	390,930	a662,946	5,336,801
Steam engines	4,873,008	1,782,640	22,924,606	25,237,305
All other engines	101,809	295,232	3,068,784	3,184,041
Parts of	....	....	b9,287,245	....
Boilers	a362,334	509,745	a868,978	3,408,377
Boiler tubes	a566,415	737,946	a1,605,792	4,369,589
All other parts of engines	a1,502,040	1,666,869	a4,136,999	17,779,871
Excavating machinery	a94,726	85,566	a179,778	1,025,371
Milling machinery, flour and grist	124,317	75,128	645,671	988,630
Laundry machinery, power	25,784	10,777	318,835	319,211
All other	26,293	19,927	201,561	171,278
Lawn mowers	21,816	6,565	166,563	237,845
Metal-working machinery (including wood-working tools)	....	....	b44,604,259	....
Lathes	a2,371,629	801,448	a5,552,631	7,858,140
Other machine tools	a1,606,481	679,468	a2,561,601	8,014,579
Sharpening and grinding machines	a765,492	384,240	a1,614,204	4,814,723
All other metal-working machinery	a3,022,107	1,679,470	a6,723,118	18,016,847
Meters, gas and water	725,640	54,133	1,048,991	207,604
Mining machinery, oil well	124,282	384,022	1,015,341	1,991,258
All other	876,196	485,772	8,182,779	6,764,276
Paper-mill machinery	197,978	131,143	1,480,669	1,248,586
Printing presses	174,807	65,468	1,309,079	953,894
Pumps and pumping machinery	599,479	453,466	4,576,773	4,490,097
Refrigerating and ice-making machinery	59,662	218,261	835,144	1,071,277
Road-making machinery	a39,486	119,181	a91,655	509,378
Sewing machines	857,449	750,476	5,925,642	5,600,844
Shoe machinery	176,512	97,221	1,187,715	945,786
Sugar-mill machinery	659,132	921,283	5,195,582	6,138,704
Textile machinery	358,415	873,911	2,540,256	5,268,504
Typesetting machines	52,861	161,572	831,532	949,469
Typewriting machines	493,106	375,907	7,199,310	5,179,215
Windmills	115,219	76,505	830,750	593,575
Wood-working machinery, saw mill	29,868	87,687	441,032	741,972
All other	101,280	62,336	813,174	712,946
All other machinery and parts of	3,746,597	3,442,822	30,739,295	31,193,784
Total	$27,947,134	$22,068,916	$203,727,900	$219,235,253

a Not separately enumerated prior to July 1, 1917.
b Six months ended June 30, 1917.

Japan 4633 tons to Canada and 3377 tons to Cuba. For the nine months ended Sept., 1918, the shipments of rails to France total 110,928 tons; to Japan, 72,205 tons; to Canada, 51,344 tons, and to Cuba, 37,960 tons.

Steel plates show a slight decrease in exports, falling from 52,395 tons in August to 47,975 tons in September. Of the latter total, Japan also received the largest share—19,761 tons; Canada received 14,223 tons.

Steel sheets revealed a slight increase—from 13,486 tons in August to 15,933 tons in September. Of the latter Japan received 5386 tons and Canada 4812 tons.

Imports of Iron and Steel

	—September—		—Nine Months—	
	1917 Gross Tons	1918 Gross Tons	1917 Gross Tons	1918 Gross Tons
Ferromanganese	3,402	102	38,875	26,271
Ferrosilicon	920	118	7,867	1,748
All other pig iron	3,926	20	16,675	1,973
Scrap	5,437	2,035	167,226	31,930
Billets	192	....	2,097	1,283
Wire rods of iron and steel	1,311	166	4,056	1,566
Bars of iron or steel iron	....	....	....	....
Plates, sheets without alloys	2,620	3,999	28,525	24,604
Structural steel billets	1,138	333	6,046	5,992
Rails	905	1,423	6,400	5,392
Steel bars	142	44	1,334	1,378
Tin and terne plates	....	....	124	32
Wire	a668	557	a6,102	4,715
All other	203	533	518	2,068
Total	20,804	9,330	285,783	124,418

a Not separately enumerated prior to July 1

Imports of Manganese Ore and Oxide

Manganese ore and oxide	36,755	72,685	494,633	382,382

Exports of structural steel rose from 20,300 tons in August to 22,545 tons in September. The largest individual share fell to Canada with 8702 tons, while France received 3444 tons. Tin and terne plates increased from 17,706 tons to 19,629 tons. Here, 5542 tons went to Canada, 2990 tons to Japan, 2458 tons to Argentina, 2470 tons to China and 1823 tons to Uruguay. The latter two countries had never previously been listed separately.

Barb wire showed a slight reduction in exports—from 35,172 tons in August to 33,691 tons in September. Of this France continues to receive by far the largest portion. Its total in September was 19,453 tons. Italy received 9001 tons and the United Kingdom 4906 tons. The exportation of other types of wire increased by 1902 tons, or from 15,554 tons in August to 16,546 tons in September. Of this total France received 5352 tons, Japan 1689 tons, Canada 1703 tons and the United Kingdom 1008 tons.

The value of exports of manufactures of iron and steel, including machinery, showed a decrease for the September figures in comparison with last year's total as well as for the nine months. In Sept., 1917, the total valuation had been $106,845,482, while in Sept., 1918, the figures were $85,224,051. For the nine months ended Sept., 1917, the total valuation was $908,160,739, as for the nine months of the present year $791,-29,420.

The figures for the exports of machinery show a decrease in September both against the August figures as well as the September figures of a year ago. The figures for Sept., 1918, were $22,068,916, while in Aug., 1918, they were $24,580,775 and Sept., 1917, $27,947,-134. For the nine months ended with Sept., 1918, they totaled $210,255,251, against $203,727,900 for the same period of last year.

Imports of iron and steel decidedly slumped, reflecting how completely our shipping is tied up in war transportation. They totaled only 9330 tons, against 18,066 tons in Aug., 1918, and 20,804 tons in Sept., 1917, and for the nine months ended Sept., 1918, they dropped to 124,418 tons from 285,783 tons in the same period of the preceding year.

There was a marked increase in the importations of manganese ore and oxide of manganese. In Aug., 1918, these had fallen to 33,975 tons, but in September they increased to 72,685 tons. In Sept., 1917, the importation had totaled 36,755 tons. For the nine months ended Sept., 1917, these importations aggregated 494,-633 tons, valued at $7,955,884. For the nine months ended Sept., 1918, the tonnage total fell to 382,382 tons, but the valuation rose to $11,539,706. W. L. C.

REGULATION OF PIG TIN

Details of Distribution in United States Through Steel Products Company

WASHINGTON, Nov. 5.—Although the arrangements for the issuance of purchasing licenses to consumers, jobbers and dealers have not yet been made, George Armsby, chief of the tin section of the War Industries Board, has prepared a preliminary announcement of the procedure under which tin is to be allocated to American industries under the new international pooling agreement. The tin price also has not yet been fixed, but is to be announced before Dec. 31.

Under the agreement made by the United States, Great Britain, France and Italy, Aug. 28, 1918, these governments determined to pool their requirements as well as their purchases of pig tin. An interallied tin executive was set up in London to control and direct all purchases of pig tin for the participating countries. This executive—a committee representing the various countries—has already appointed its buying agents in the principal producing countries, and the machinery of purchasing has been in operation for several weeks. All purchases are to be made through this executive and no participating country will grant import licenses except for tin purchased in this manner.

The War Industries Board asked the American Iron and Steel Institute to assume charge of the importation, financing and distribution of the pig tin for the United States, and the Institute will operate through the United States Steel Products Co. The latter will receive and pay for the tin at the source and will distribute it at cost to the consumers, jobbers and dealers licensed for this purpose by the War Industries Board.

Consumers, jobbers or dealers requiring spot tin, says a statement issued by Mr. Armsby, can be assisted in locating available stocks by communicating with the Subcommittee on Pig Tin of the American Iron and Steel Institute, Room 1811, No. 71 Broadway, New York. A report made to the War Industries Board Oct. 1 indicated that there was at that time a maximum stock of spot tin on hand in the United States.

Import licenses covering contracts made prior to Oct. 1 will still be granted, provided satisfactory evidence can be produced that the tin was actually purchased prior to that date.

At the request of the War Industries Board the War Trade Board has adopted the following procedure to carry out the international pooling agreement:

(1) The revocation of outstanding licenses for the importation of pig tin, tin ore and concentrates, or any chemical extracted therefrom as to ocean shipment after Oct. 20, 1918, shall remain in effect.

(2) The Bureau of Imports is authorized hereafter to issue licenses for the importation of pig tin, where the applications therefor are otherwise in order, to cover shipments purchased prior to Oct. 1, 1918. For this purpose the date of purchase is to be determined by the American Iron and Steel Institute. Licenses so issued are to provide for the endorsement of the bill of lading to the American Iron and Steel Institute.

(3) The Bureau of Imports is authorized to issue licenses for the importation of pig tin, where the applications therefor are otherwise in order, to the United States Steel Products Co., regardless of the date of purchase of said pig tin. Licenses so issued are to provide for the endorsement of the bill of lading to the American Iron and Steel Institute.

(4) The Bureau of Imports is instructed to issue no licenses for the importation of pig tin except those described in paragraphs 2 and 3 above.

(5) The Bureau of Imports is authorized to issue licenses for the importation of tin ore, tin concentrates and chemicals extracted from tin ore in accordance with its rules and regulations covering the licensing of the importation of these commodities in force on Oct. 4, 1918.

Feeding Employees at a Steel Plant

Reasons for Abolishing the Dinner Pail—Management of Lunchroom—Auxiliary Room for Foreigners—The Commissary

THE following paper on industrial lunchrooms was presented to the foundry section of the National Safety Council at its seventh annual congress, St. Louis, Sept. 17, by H. H. Haylett, director of employment and welfare, Benjamin Electric Mfg. Co., Chicago. Mr. Haylett was for two years in charge of the lunchrooms and commissaries of the Commonwealth Steel Co., Granite City, Ill., and his paper dealt mostly with his experience gained at that time.

Reasons for a Company Lunchroom

Our company felt there was large value in wholesome food for the workmen; that many workmen left their homes in the morning with an improper dinner in their pails—either because the wife was sick or some other adverse condition had prevailed. Very often the need for economy prevented getting the proper food. Often, too, the nearby saloon offered a substitute, with liquor and "free lunch," for a proper meal. We also felt that there would be considerable value in removing our men from the associations of their work for a half-hour at noon time, where sociability and goodfellowship should take the place of shop etiquette and where the men would be taken away from the environment of work and thrown into another sphere, which, of itself, would be recreational in its influence upon them, for even when the food itself is nourishing and readily digestible, it happens frequently that it has to be eaten under conditions which militate against its real value. A meal taken amid dirt and dust in close atmosphere of a shop, which has been occupied for some hours by a body of toiling workmen, gives but little stimulus for healthy digestion. We therefore decided to abolish a small, poorly equipped lean-to, where an outsider had been serving lunches to our workmen, and took the following fundamentals as our guide for the new works restaurant:

Fundamental Requirements

Convenient Location.—The restaurant must be convenient to the workmen.

Attractiveness.—It must be attractive, light, airy, well spaced, and with plain but neat, clean and attractively substantial equipment.

Prompt Service.—Service must be prompt and adequate; slow service is certain to make the works restaurant a failure.

Hours.—The restaurant should be open at all hours when there are night shifts. Coffee, tea, cocoa and milk, together with rolls, sandwiches, pie, etc., should be obtainable at any time.

Food.—The food served should be of first-class quality; fresh, properly prepared and cooked, appetizing, and of sufficient variety.

Prices.—The price of the food to the workmen should be so low as merely to cover cost, or at most to provide only a small margin above cost. The price of any given meal or article of food should be prominently displayed. This is essential for prompt and satisfactory service.

Payment for Food.—Method of payment should be by placing a check on tray before workman eats, and his payment of cash, or coupon, to cashier upon his exit. Tickets purchased in advance save the workmen from carrying much loose change in their work clothes.

Management.—First and last, the success or failure of the works restaurant depends upon its manager.

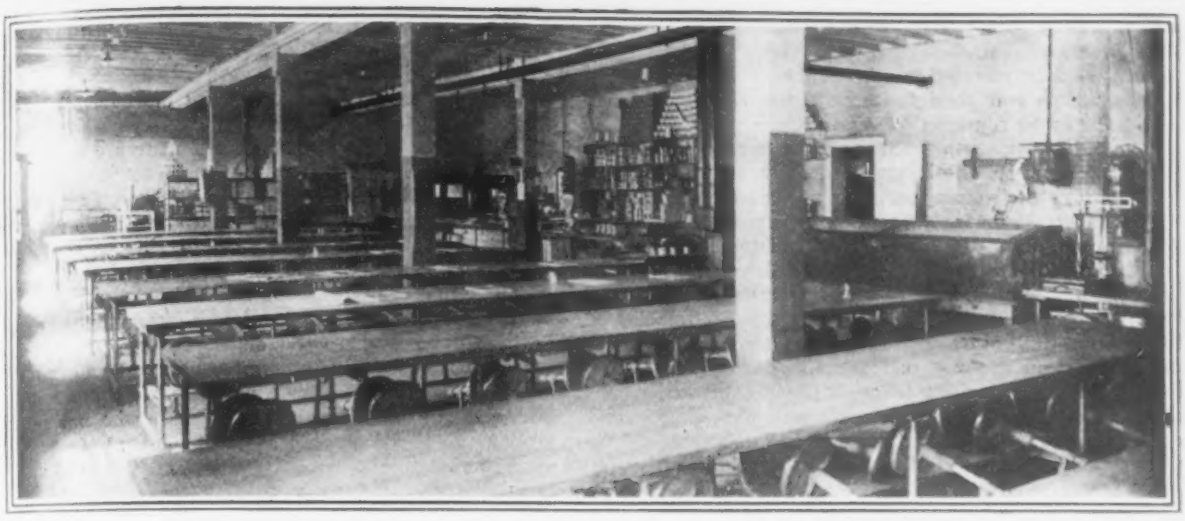
Location and Attractiveness

With these requirements in mind we rehabilitated an old pattern storage shop within the plant and centrally located near the administration offices and shops. A kitchen addition was made to this building, all floors were made of concrete, and kitchen and lunchroom equipment to the value of some $14,000 to $15,000 was installed. An improved type of table was selected, which after various changes were made became the standard for the lunchroom. Plenty of light and ventilation were secured by the use of this old shop and, after the rafters had been concealed and the decorators had finished their work, we found ourselves with ideal conditions in which to install window boxes, hanging baskets, etc., to make the place cheerful and homelike.

The cafeteria plan was adopted, because of the increased facility it afforded for rapidly handling a large crowd.

The noontime and midnight meals, of course, were the heaviest meals. However, much might be said of the men who had their breakfasts and evening lunches from this lunchroom. Many times home conditions

Plant Cafeteria in Remodeled Pattern Shop Building Serves 1800 to 3000 Workmen. Six minutes is required to gather the food and seat a man. The 30 minutes devoted to a meal of wholesome food served at cost is in this way a period of recreation and sociability that stimulates efficiency and output



Auxiliary Lunchroom for Foreign Workmen, Who May Fetch Their Own Food, Heat It Over a Gas Plate and Rinse the Pail, etc., at a Sink. An employees' store, with grocery and fresh meat department, is shown in the background

were such that they would have come to work from a hastily and poorly prepared meal had it not been for their opportunity to step into the plant lunchroom and quickly secure necessary nourishment for their morning's work. The lunchroom has served from 1800 to 3000 meals daily during normal conditions. The men are seated within six minutes at the noon and midnight rushes and the lunchroom is practically clear one-half hour after the whistle blows. When facilities became overcrowded at meal time it was necessary to allow certain departments the use of the lunchroom one-half hour earlier.

Under this plan it was found to be necessary to keep on hand a force of some 30 employees for every 1000 persons served at one sitting. Where special waiter service, however, was required—such as might be the case in serving a force of the administrative or clerical employees, superintendents, foremen, etc.—the lunchroom staff must necessarily be correspondingly enlarged. However, the cafeteria plan was found adaptable to practically all of the employees of the plant and the curve of efficiency invariably rose after a hot lunch.

Plain, wholesome cooking, with only the best quality of materials is furnished. During normal times it was found that the average cost per meal, figuring from monthly statistics, showed 17 cents per employee per meal in this lunchroom. Recent conditions, of course, have necessitated a gradual increase in these prices, but a real saving is still effected and the quality has not depreciated.

The lunchroom was to be run without profit and without loss, as far as possible; the company, however, agreeing to meet any deficit required, feeling that such expense would be much offset by the additional efficiency and value of an employee's work toward the end of the day, after a hot, wholesome meal had been served him at noon, as compared with his value at 5 o'clock after having eaten a cold lunch from his dinner pail, in the same environment in which he had been at work all day.

Method of Payment for Meals

The problem of paying for meals rapidly, as employees were leaving the lunchroom, was solved by the installation of a checking system, by which a printed ticket was placed upon the employee's tray, totaling the amount of his purchases, as he left the service counter. He then was free to eat his lunch at any table which he might select, but in leaving the dining-room, after his meal was finished, he passed the cashier's cage and there he paid for his meal, either in cash, if he so desired, or by coupons issued by the company, in the denomination of 5 cents each, so that if a meal totalled 17 cents, he would, in all probability, pass in four 5-cent coupons and receive a cash refund of three pennies, or he might produce two pennies and three coupons. Most of the men preferred to secure pennies in change, however, to take home to their children in the evening. Some men frankly admitted that they looked for the odd change for this purpose.

Management Invested in Employees

A board of governors, elected from employees who were members of the Employees' Fellowship Club, was made the advisory committee in the management of the lunchroom. Through this agency every employee in the plant had opportunity for suggestion or helpful criticism in the management of the lunchroom. The company, however, employed its manager and looked to him for efficient results.

Constant supervision and the careful adaptations of means to ends are needed on the part of the manager of an industrial lunchroom. He must have great tact and discretion, be able to judiciously select appropriate menus; to prevent loss of good food which must be sold quickly and at a low price, such as the worker can afford to pay. He must be a good buyer, for the average plant must look to him to make the purchases for his department, rather than to the plant purchasing agent, who is usually not qualified in this line, and he must be given the financial resources of the company to make adequate purchases when the market conditions are right. Food materials can be made to pay, but the incidental expenditures are relatively heavy. Therefore the tariff can only be kept low by careful management.

Many successful innovations may be tried to vary the daily operation of an industrial lunchroom. If there is a plant band it may occasionally be used at noontime to the enjoyment of the employees. Some official of the company may donate a victrola and the employees furnish the records, moving pictures may be shown in a shadow box, while canary birds invariably tune up during the rush periods and help to give a homelike atmosphere to the room.

Auxiliary Lunchroom for Foreigners

We later provided a room, separate from, but adjoining the main lunchroom, where the same line of equipment, such as tables, etc., is found as that maintained in the main dining room. Here, however, is provided a room for the man who prefers to carry his own lunch, and here he may come, without any charge, into a well-heated building, kept clean and sanitary. Provisions are made so that he may heat his coffee pail over a gas plate provided for this purpose—later washing same in a nearby sink—and here he will find numbers of men from other points in the plants doing the same thing. If, however, in addition to the lunch which he carries, he should desire a bowl of soup, a cup of coffee, or a piece of pie, as the case may be, to augment what he has brought from home, he may procure same at the prevailing rates charged in the main dining-room.

There has been a great deal of use made of this section. It has a seating capacity of some 200 employees and has tended to keep refuse, paper, etc., localized and away from points where it would litter the

plant. Many men who make use of this lunchroom are foreigners, who prefer their own types of cooking to those generally adopted in our country. The same spirit of sociability and good fellowship prevails in this section as is to be found in the main lunchroom.

Another outgrowth from the lunchroom idea was the retail section, or employees' store, from which there was sold to the employees who so desired any of the same materials or food which were served in the main lunchroom. Canned goods, fresh meats, coffee, vegetables and all staples were soon in demand after the opening of this employees' store, with the result that the buying capacity was increased by the combination of lunchroom and store handled together. Waste was eliminated and many direct benefits derived.

The point of contact through the lunchroom, which the employer receives, with his employees, is of vital concern in the average plant, and any thought on the part of the employee that his employer is looking after his physical needs, as well as providing him with an opportunity to render faithful service with fair compensation, makes him put more zest into his work and show a better type of appreciation and more loyalty for his firm.

Surely, in addition to these features, the necessity for conservation, under the immediate war conditions, would make it seem wise to help the employee be economical and still provident in the matter of his own meals, and any employer who displays such interest soon finds a reflex action on the part of the employee which figures fail to account for in dollars and cents.

The industrial lunchroom has, therefore, many opportunities of service to the employee and its returns to the company, for any amount of capital which may be invested in it are amply taken care of in more efficient workmanship on the part of the man who has received proper consideration and the nourishment necessary to carry on his work.

CASTING UNDER PRESSURE

Non-Ferrous Alloy Products So Made Possess Unusual Physical Properties

A process for forming castings of certain non-ferrous alloys is announced by the Morris Engineering Co., 39 Cortlandt Street, New York. Direct comparison is made between this and the usual method of casting such mixtures in sand. Parts made by the Morris process are said to possess greater tensile strength, increased density and freedom from blow holes. Their crystalline structure is said to be finer and the machining qualities improved.

The Morris process consists in pouring the molten alloys into metal molds and forming or congealing the castings under pressure. They are really die castings formed under high pressure. A large number of fuse bodies for shrapnel have already been made in this way, the composition being 80 per cent aluminum and 20 per cent zinc.

The castings are made in a specially constructed automatic machine, by which several hundred are turned out per hour. Among the alloys already produced is one of 60 per cent copper, 40 per cent zinc and a trace of lead, having a tensile strength of 49,500 lb. per sq. in. and an elastic limit of 29,750 lb. with an elongation of 45.5 per cent in 2 in. Another alloy of 86.5 per cent aluminum, 12 per cent zinc and 1.5 per cent copper was found to have a tensile strength of 42,700 lb. per sq. in., an elastic limit of 29,400 lb. and an elongation of 12.5 per cent in 2 in. The specifications for British fuse bodies call for an alloy of 80 per cent aluminum and 20 per cent zinc with an elongation of 7 per cent in 2 in. The average of 16 tests made on an alloy of this composition and produced by the Morris process showed an elongation of 14.47 per cent in 2 in., with a tensile strength of 41,440 lb. per sq. in. and an elastic limit of 30,400 lb. In the filling of a large order for fuse bodies there was a loss of only 5 per cent due to rejections.

Recently the U. S. Bureau of Standards made an investigation of the 90-10 aluminum-copper alloy by this process and compared it with the product of the sand-cast process. Extracts from the report follow:

> The 10 per cent copper-aluminum alloy as sand cast showed a normal tensile strength of approximately 20,000 lb. per sq. in., with an elongation of approximately 1 per cent (forged) as compared with tensile strengths of from 35,000 to 40,000 lb. per sq. in. and elongation of from 8 to 10 per cent of the same alloy when in the drop forged condition. The strength of the drop forging is almost double, the ductility from 5 to 10 times as great, the toughness, therefore, from 10 to 20 times as great as that of the sand casting.
>
> Hard castings can be produced in sand or in dies but they are without exception brittle, having very little ductility.

An interesting result of the process is the making and handling of an alloy of aluminum, copper and iron which has a low coefficient of expansion. While the ordinary piston made of aluminum and copper has a high coefficient of expansion, the introduction of the iron is regarded as making it possible to produce very large aluminum pistons for high power aircraft engines—even larger than have yet been produced.

In THE IRON AGE, Feb. 7, 1918, a description was given of the frame work of a German zeppelin together with the analysis. This showed a composition similar to the one already mentioned: 91.92 per cent aluminum, 4.13 per cent copper and 3.27 per cent iron. It was stated then that evidently the iron had been introduced intentionally and that the tensile strength was probably about 40,000 lb. per sq. in. This zeppelin alloy is analogous to the one recommended for aluminum pistons under the Morris process and corresponds to a United States patent (No. 1,227,174) covering such alloy.

One of the possibilities of the process is that important parts of aircraft motors can be made of great strength and lightness. In the case of pistons, the strength can be put into the head and the bosses where it is needed and they can be machined down to lighter weight and still possess unusual strength. The process has been patented in the United States, Great Britain, Japan and other foreign countries.

British Machine Tools and After-War Orders

The British Controller of Machine Tools, says the London *Ironmonger*, has issued a circular to the trade stating that, although the demand for machine tools for urgent war work renders it impossible to make or deliver machines for post-war requirements, it has been decided to permit manufacturers to take orders for non-war work upon condition that its manufacture is not proceeded with until the sanction of the department is obtained. It will not be necessary for manufacturers to submit these orders to the department for approval, but it is possible that the conditions may alter to such an extent that the department will see its way to grant certificates of priority as to certain tools which are urgently required by contractors to enable them to give employment to the maximum number of employees immediately after the termination of hostilities. Until such general permission can be given, manufacturers are permitted to manufacture machines only to satisfy definite orders approved by the department or to carry out manufacturing programs which have been approved by it. The price regulations in force are to apply to all machine-tool orders, whether for munitions work or not, until such time as circumstances may warrant their withdrawal.

A study of living costs and wages, 1905-17, in territory contiguous to the operations of the H. H. Frankling Mfg. Co., Syracuse, N. Y., is published in *Industrial Management*. The conclusion reached is that living costs have increased 78.8 per cent during that period, while wages have increased 106.5 per cent.

Making Sand-Cast Forging Ingots*

Development of the Practice on the Pacific Coast—Replacing Eastern Ingots —Advantages Claimed for the Sand Mold

BY W. L. BOOTH

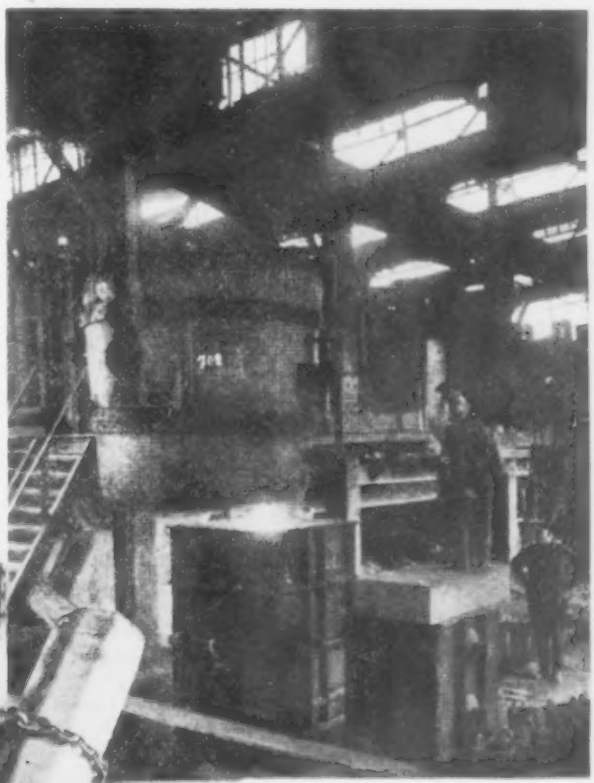
THE Judson Mfg. Co., Oakland, Cal., was the pioneer in the successful manufacture of sand-cast forging ingots on the Pacific Coast. Before the development of the present type, the only ingots made on this coast, besides those cast in a steel cylinder and commonly known as tin-can ingots, were some cylindrical sand-cast ingots made by the Llewellyn Iron Works.

In order to develop a better type, the Pacific Coast Steel Co. and the Judson Mfg. Co. jointly employed O. L. Johnson and C. E. Duncan to carry on the experiments which have caused the development of the present satisfactory type of ingot. This is now being manufactured in large quantities by both companies. Before the Judson Mfg. Co. succeeded in producing a satisfactory sand-cast forging ingot, the U. S. Shipping Board planned to have the shafts for its ships made in the East. This would have meant that only the machine work would have been done in the West. These experiments have done much for the steel industry on the Pacific Coast.

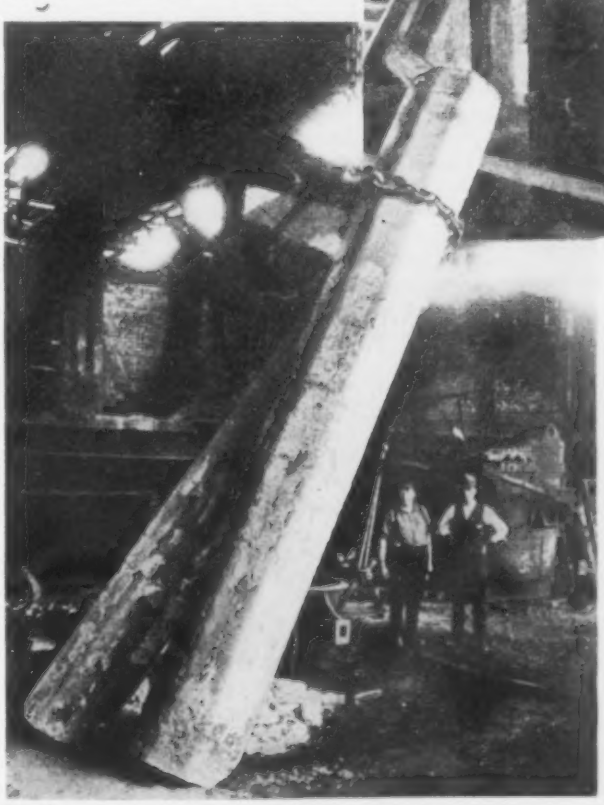
When the steel enters the ingot mold, it first forms a solid surface layer or skin, which, being in contact with the cooler walls of the mold, cools at a faster rate than the interior portion of the ingot and forms a solid shell that will not yield when the interior of the ingot cools and shrinks. In consequence, the contraction causes the molten steel to "draw down" from the top, leaving a hole or pipe in the center of the upper part of the ingot. In some of the steel-shell ingots, the pipe extends a third of the way down, and this must all be cut off and discarded. As the big ingots weigh 255 lb. for each inch of depth, this means a large loss of steel. The pipe is present in all ingots, and the experiments mentioned above were not directed toward its elimination, but rather toward lessening its size and depth. Some of the conditions favoring the formation of the pipe are hot steel, rapid pouring, rapid chilling of the surface of the ingot, unsuitable form of ingot, and improper chemical composition.

The advantage of sand molds for large ingots is that the sand, having a low conductivity, does not permit rapid abstraction of heat from the skin, and thus the heat from the molten center is conducted to the skin nearly as rapidly as it is radiated from the mold. In consequence, the entire mass of steel sets at a more even temperature than when cast in any other kind of mold.

The shape of the ingot was found to be of great importance in minimizing the size of the pipe. When the ingots are cast in a cylindrical steel shell there is not only a rapid chilling of the skin but also an unyielding form which, in the process of further cooling within the ingots, compels the shrinkage to be entirely in one direction, namely, outward, since the arc formed by the solidified metal is of great strength. A corrugation or "valley," which always forms along these "tin-can" or cylindrical ingots, is the result of the first contraction of the skin, which is able to move inward without resistance, the interior being still molten. The skin, however, has become attached to the steel cylinder. Since the cylinder is relatively cool at the moment of welding it cannot contract with the metal next to it and consequently folds inward. This of itself would not matter greatly, but it is well known that a valley in any casting cools more slowly than a convex surface, so that the bottom of this valley remains hotter than the remainder of the surface. Therefore, when the strain comes from within, it cracks because of its lower strength due to the higher temperatures and the fact that the structure had been disturbed.



Pouring the Sand-Cast Ingots in a Special Mold



Two of the Completed 16-Ft. Sand-Cast Ingots

The present type of ingot appeared to be one that would provide for the forces at work during cooling. It is octagonal in section, with the corners rounded and the faces depressed. This ingot first cools along the corners, the

*From an article in the October issue of *Metal Trades*, San Francisco. The author is general manager Judson Mfg. Co., Oakland.

curved faces lagging somewhat behind. At the moment of pouring, the skin forms as usual and the ingot shrinks from the sand unresisted by the liquid interior. Later the inner portion contracts, and the skin, having been kept at a temperature not much below that of the interior, and particularly that of the depressed portions, is still soft enough to move inward on the face and prevent excessive piping. The advantage of the sand mold to hold the heat during the action of solidifying is thus apparent.

The ingots which are now being cast are bottom-poured, although this method favors the lengthening of the pipe. Bottom-pouring is necessary on account of the great depth of the molds, 16 ft., since the steel falling that distance in deep pouring would splash badly and produce a great many shot surrounded by the liquid steel but not welded. These would later develop surface defects under the hammer.

The octagonal ingots shown in the illustration are 34 in. across, which is equivalent to a 30-in. square. The weight before cropping is 18 1/3 tons each. This type of ingot is remarkably free from pipe and other defects and is up to the standard of the best Eastern ingots. Out of a run of 50 recently, only 3 were rejected.

Holland Permissible Export List

WASHINGTON, Nov. 4.—The War Trade Board has revised again the list of commodities which will be considered for exportation to Holland (European). This is the seventh revision of this list since February. It was effective Oct. 28. Among the items on the new list are the following:

Adding and calculating machines; athletic goods not containing rubber or leather; automobiles (passenger), bicycles, motorcycles, and spare parts of, but no tires and no accessories; cash registers; clocks, including clocks for time checking; table, dessert, butchers', cooks', bread, carving, pocket, hunting, painters', palette, shoemakers', pruning, budding, and bowie knives; lighting fixtures if of iron or steel; cotton-goods machinery, laundry machinery, not containing rubber or copper, sugar-refining machinery, printing presses not containing an undue proportion of copper, nickel or antimony, type-setting and type-casting machinery, excluding type-metal; spare or replacement parts of machinery; medical and surgical appliances other than those containing rubber; scissors; steel carving sets; razors, including safety razors and blades not containing nickel or tin; electroplated goods and silverware containing not more than 5 per cent nickel or copper; hardware for builders if of iron or steel; household furnishings, fixtures, and equipments if manufactured of wood, iron, or steel; screw spanners for cycles; sewing machines; scales and balances, not including weights of copper or brass; pen nibs; plumbers' goods, if of iron, steel, or earthenware, and sanitary earthenware of not more than 7½ per cent in weight of brass fittings; typewriters and spare parts and accessories, except typewriter ribbons not cut for use and except ribbons over 2 in. wide.

All shipments to European Holland, except those consigned to the government of the Netherlands, must be consigned directly to and only to the Netherlands Overseas Trust.

New Engineers' Training Camp

WASHINGTON, Nov. 5.—The War Department has decided to locate a new Engineers' Training Camp at Fort Leavenworth, Kansas. Accommodation will be provided for 16,000 men. Work will be begun at once under the supervision of the Construction Division. The estimated cost of the project is $5,000,000. The contract has been awarded to W. M. Southerland Building & Construction Co., St. Louis. The construction will be similar in type to that of the general Army camps and cantonments. In addition to the barracks, there will be erected the usual utilities buildings and hospitals.

The Construction Division of the Army also is authorized to begin at once the construction of additional buildings at Camp Kearney Cal., to accommodate 9000 men. The estimated cost of the work is $1,924,923. Additional brigades for the artillery, as well as the development battalions, will be trained in this camp.

In addition to these larger projects the Construction Division has been authorized to build an addition to Watervliet Arsenal to increase the facilities for the manufacture of mobile artillery. The cost of this project is estimated at $115,000. Other projects include: Improvements of roads at Camp Humphreys, Va., $111,040; installation of heating equipment at Langley Field, Va., $79,000; barracks at Camp Travis, Texas $77,000, and a cold storage plant at Camp McArthur, $50,000.

LOCOMOTIVE BUILDING

Rate of Production Increased Rapidly in Past Three Months

WASHINGTON, Nov. 5.—The standard gage steam locomotive industry of the United States, operating under the direction of the War Industries Board, has increased its rate of production approximately 100 per cent in the past three months, says an announcement of Chairman Baruch. In the last week of October the output of the three standard gage companies was 144 locomotives. Since 1910 and up to last August, the highest number ever turned out in a single year was 3776, which would represent an average weekly output of 72.6 locomotives.

"The achievement is particularly noteworthy," says Mr. Baruch, "because in bringing about this tremendous jump in production, it has been unnecessary to expend a dollar to increase plant facilities or enlarge the existing works—items of considerable expense in the development of most of the other war industries of the country. Redistribution of orders and concentration by each of the plants on particular types of locomotives have made possible an intensity of effort unprecedented in the industry."

The "Pershing" locomotive, built on standardized plans designed by the United States Military Railways, has not only been made the sole type of steam locomotive in use behind the American lines in France but, at the instance of the War Industries Board, has been adopted by the British and French governments as the standard type for their armies on the western front.

Last August the Government, face to face with an immediate and urgent demand for steam locomotives for use in this country and France, was seriously considering the establishment of Government plants to meet the emergency. It was proposed that approximately $25,000,000 should be spent for this purpose. At the suggestion of the War Industries Board the expenditure was held up in favor of the present plan.

Under the arrangement adopted, the construction of all the locomotives of standard gage for use in France was assigned to the Baldwin Locomotive Works, whereas all orders for the United States Railroad Administration were divided between the American Locomotive Co. and the Lima Locomotive Works. These three companies comprise the entire standard gage steam locomotive industry of the country. By this method of distributing the work, each of the plants has been able to develop extraordinary speed. Last week's output represented work done during the period of the influenza epidemic, when labor at the plants was considerably disorganized. During the next 30 days, in the opinion of J. Rogers Flannery, director of Railways Equipment and Supplies, the rate of production will show a still greater increase.

The Government is spending this year in the construction of locomotives—both for use in France and on the Government operated roads in this country—approximately $200,000,000.

A paper on characteristics of American coals in by-product coking practice, presented some time ago to the Franklin Institute by F. W. Sperr, Jr., chief engineer H. Koppers Co., Pittsburgh, has been published in pamphlet form, and a copy can undoubtedly be had by addressing the Koppers company.

EXPORTS AFTER THE WAR

Many Imporant Problems Discussed at Meeting of Manufacturers in New York

The convention of the American Manufacturers' Export Association in New York, Oct. 30 and 31, was largely attended, and an excellent program was carried out. Many of the papers and much of the discussion related to the carrying on of export trade after the war, leading topics being, "Education for Foreign Trade Service," "Patents and Trade Marks," "The Relation of Government to Foreign Commerce, "Commercial Treaties and Trade Agreements," "The Merchant Marine After the War" and "Sales Organization Abroad."

Burwell S. Cutler, Chief of Bureau of Foreign and Domestic Commerce of the Department of Commerce, Washington, made an urgent appeal for an expansion of that department to meet the demands that will be made upon it after the war ends. He said in part:

Urges an Expanded Department of Commerce

"There are only 11 American commercial attaches," said Mr. Cutler, "because funds for more do not exist. Our new estimates call for 18. We do not purpose, it is true, to go as far as our British friends, for the United Kingdom proposes to have 27 and Canada 23, under the name of resident trade commissioners; and other countries in proportionate number. Nor would disparity between their plans and ours be wholly removed by our own establishment of resident trade commissioners in about 10 regions of minor political importance.

"Instead of being content with 30 traveling agents covering the entire world, as last year, we are asking now for 30 in Europe alone (when the war is over), and as many more in the Far East and South America.

"Our conception of the future foreign trade and of the use of our merchant marine in connection with it is that of service. We should think it ill to alter the high ideals of mutual service now prevailing during war into ideals of mutual injury after the war. Commerce is not in our thought a more humane species of strife, but in any vital understanding of it is a matter of mutual exchange for mutual benefit. Nor will it do to forget that among our associates in the war are those who have been at once the source of supply for many needed things and also our own largest customers.

"But our foreign technical service must be reinforced and organized by a force at Washington that can test the work for scientific accuracy, unify it, tabulate it for comparison with previous data, attach correct conclusions, and put it into readable form for you merchants. The Bureau should have for this purpose highly competent statisticians, economists, commodity specialists, customs experts, shipping advisers and so forth; without them the authority and helpfulness of your Department of Commerce fails completely. Men of such grades receiving decent salaries of $3,000 to $6000 are allowed to the regular Government commissions and to some of the war boards, whereas we are restricted to salaries around $1800 for some of our best research men. As a result, the bulk of our work falls upon overworked division administrators who tire out and leave us."

Plan for Greater Service

Eventually, the convention was told, the Department of Commerce should have added to it a Bureau of Industrial Practice that would aid in eliminating waste in man power, time, material and overhead cost, also a Division of Material Valuation, for studying the original sources, the handling and the grades of foreign and domestic materials, a Division of Information on Internal Water and Railways, a Division of Distribution Economy, and a Division of Cost Finding Methods.

"We at Washington," explained Mr. Cutler, "are not so lost in the details of our daily routine that we do not frequently lift our eyes to the commercial horizon and see new developments in prospect. The main purpose back of our daily work and our plans for the future is just this: We want to give the commercial public a steady flow of trade and industrial information, comprehensive, straight to the point, and usable. Nor should it fail to deal with every phase of business where there is a fundamental problem. Without such helpfulness and advice, our business interests may be outstripped by European operators. For we know that the European manufacturer and merchant, under the spur of war needs, has acquired habits of scientific management that have made him more efficient than ever before. During the last four years he has been forced to measure with sensitive scales his scanty resources in men, materials and time, and certainly our own producers must observe the same rules of scientific precision if they hope to hold their own in competition. There is not the slightest doubt of our ability to meet all comers on an equal basis if we add to our natural energy and ingenuity a determination to be guided by facts properly ascertained and explained. No agency is better able to discover and collect the facts than the Department of Commerce."

Must Pay in Securities

At the banquet at the Waldorf-Astoria Thursday evening, Frank Vanderlip, president, National City Bank, New York, delivered an impressive address. He said in part:

"We talk a great deal about extending our foreign trade in the period immediately after the war, but we cannot extend our foreign trade unless buyers have the means of payment. Now the means of payment consist of other goods to be shipped to us, or money, or credit. The amount of other goods will be large, but the amount of money will be nil, and the demand for credit, it seems to me, will be imperative. These nations must have raw materials, they must have food, and they will need a good deal of our manufactured commodities. It would seem to be a fair prediction that the very basis, the fundamental foundation of any expansion of foreign trade on our part must be a willingness on the part of the people of this country to accept foreign obligations.

"Therefore, I believe that the banks are to have a tremendous rôle to play in the rehabilitation of Europe, in the rehabilitation of the whole world, for the whole world has been wrecked. The wreckage has not been alone confined to the countries where the war has been. Raw materials are exhausted in many countries. The need for food today in the Scandinavian countries is as great almost as it is in Germany itself.

"We must make great shipments of foodstuffs, of raw materials, and, in a less measure, manufactured products immediately after the war. And they cannot be paid for by equal shipments of goods to this country; they cannot be paid for by the further exportation of gold to this country. It would be unwise for us to demand that, and, therefore, they must be paid for, it seems to me, by the flotation here, first, probably of government securities, and then of corporation and other foreign obligations."

Manganese from Chihuahua

WASHINGTON, Nov. 5—Due to the present high price of manganese ore ($18 U. S. currency per ton f.o.b. Chihuahua) much interest is being taken in the location of claims and in exporting manganese to the United States, says a report from Consul J. B. Stewart at Chihuahua, Mexico. More than 50 claims have been registered at the local mining office of the Federal Government during the last three months. These claims are located in the immediate surroundings of Chihuahua, along the railroad southeast of Chihuahua as far as Ortiz, and west of Chihuahua along the North West Railroad of Mexico. The first shipments were made in September, 1917, and at present about 350 tons are being exported monthly to the United States. The manganese shipped averages 40 per cent, some running as high as 48 per cent.

BURNING OIL IN CUPOLAS*

Recent Developments in the Use of the Stoughton Process in a Converter Foundry

BY JOHN HOWE HALL

This paper is a brief report of progress with the use of the Stoughton oil-burning process as applied to two cupolas used at the Taylor-Wharton Iron & Steel Co.'s plant at High Bridge, N. J., to melt iron for a 3-ton converter.

The metal melted in these cupolas, which are used on alternate days, is run into a receiving ladle on a platform scale and carefully weighed before being put into the converter. As it is not very easy to change the receiving ladles which are of a special design and are mounted on trunnions with an arrangement for attaching to a gear and hand wheel for rotating them, it is essential that the metal from the cupolas be hot enough so that the receiving ladle is not heavily sculled in the course of a day's run, which will average from 15 to 25 blows or slightly over. The converter runs on a schedule of three blows per hour, and as far as possible the entire amount of metal for one blow is accumulated in the bed of the cupola before tapping.

The cupolas themselves are lined to about 42-in. diameter at the bed and the four tuyeres are about 30 in. above the bottom. The tuyeres now used are 3½ in. high and 15 in. wide and are made up of brick, which demands the use of a brick tile to form the top of the tuyeres.

At the present time, when we are averaging 16 or 17 blows a day, this brick tile frequently lasts two days and sometimes three. Some months ago when we were averaging from 20 to 26 blows in a day it was necessary to replace the brick tiles on three and generally four tuyeres every morning.

Above the tuyeres the lining of the cupola is made up of a bosh brick, which is so shaped that the cupola is boshed 3 in. on a side at a point 27 in. above the tuyeres. From this point the lining goes up approximately straight.

Supply of Oil and Air

The arrangements for furnishing oil and air to these cupolas is comparatively simple. The cupolas are provided with a bustle pipe of circular cross section entirely separate from the cupola shell. From this bustle pipe four short down-comers are brought, each of which branches into two blast pipes which enter one on each side of a square wind box lined with brick. The two pipes enter at an angle of about 45 deg. so that the entering blast is directed approximately toward the center of the tuyere opening.

These pipes carry the main supply of air, which is furnished by a fan at a maximum pressure of about 10 oz. under ordinary conditions. A Clark blast meter is attached to the main air line, and we usually keep the supply of air at about 3800 to 4200 cu. ft. per min. The four burners are a modified type of Hauck burner and are arranged so that they can be moved backward and forward in the tuyere opening to secure the best combustion. The oil and air are fed to the burner through two pipes which pass through a small opening in the cast-iron cover-plate of the wind box. The cover plate has two small peep-hole openings, and an opening at the bottom to drain out any slag in case the cupola is not tapped in time and slag is run into the wind boxes.

The oil is fed to the burners at about 45 lb. pressure and is atomized by compressed air at about 90 lb. The oil used is an ordinary fuel oil furnished by the Standard Oil Co. and our figures on it indicate a specific gravity running from 850 to 870, a flash point from 180 to 240 deg. Fahr. a fire point of from 200 to 250 deg. Fahr. and a heat value of about 130,000 to 150,000 B.t.u. per gal.

When we first started using oil we tried many coke ratios and many different rates of feeding the oil to the cupola. As our chief object in using the process was to cut down the sulphur in our steel we were only incidentally interested in the saving of coke. We found that we could reduce our sulphur without great difficulty about or two points, that is, if we were using coke and making steel that ran 0.08 per cent sulphur, we could get steel of 0.06 per cent sulphur or a little over with the oil. Possibly by cutting down the coke and increasing the quantity of oil burned it would be possible to better this figure, but we found when we did this that the rate of melting in the cupola was increased so much that the converter and the foundry could not handle the metal fast enough.

We have used so many grades of pig iron, scrap and coke since we started the oil last February that it is virtually impossible for us to give hard and fast figures for the difference which the oil has made in the sulphur content of our steel and in the handling of the cupola. We hope very much that before another meeting of the society we shall again make a great deal of ordinary carbon steel and that the specifications we have to meet will be such that we can make an exact comparison between running the cupola with coke and running it with oil, all other conditions being identical. For the present it is enough to say that with coke running 1 per cent sulphur and pig iron and scrap below 0.035 per cent in sulphur we are now turning out steel running from 0.045 to 0.065 per cent in sulphur. For these heats we use a 12 to 1 coke ratio and burn about 60 gals. of oil per hour, and the iron melted will run from the cupola at about 1.5 per cent silicon and about 1 per cent manganese. The charges consist at the present time of 1900 lb. of pig iron and 1350 lb. of scrap, of which approximately one-third is manganese steel scrap.

Keeping the Tuyeres Clear

Before we installed the oil on these cupolas they were provided with four tuyeres each 4 x 10 in. in cross section. When melting with coke alone and using a metal of the composition indicated above, we had a great deal of difficulty with slag and metal getting into the tuyeres, especially if we made more than 16 or 18 blows a day. When this happened the cupola tenders had a severe job keeping the tuyeres open with bars and sledges and the cupola of course, ran very slowly and badly. The use of the oil has been of considerable advantage from this point of view, as the hot flame of the oil burners keeps the tuyeres sufficiently hot so that almost no poking is required to keep them perfectly clear.

The use of fuel oil has been a great advantage under very difficult conditions in the three following respects: It has assisted in saving coke at a time when coke is high in price and of uncertain quality; it has diminished the labor of handling the cupolas, and it has contributed very largely in cutting down the surplus in the steel produced.

Consumption of Fuel

We do not feel that our figures for oil consumed are necessarily exactly accurate, on account of the difficulties which almost always crop up with oil meters. With this reservation, we give below the consumption of fuels for the months of June and July and the total number of pounds of metal charged to the cupolas for the same months:

June

2,092,300 lb. of metal charged.
198,974 lb. of coke burned.
2,000 lb. of hard coal burned.
6,970 gal. of oil used.

This gives a total of 10.45 lb. of metal per pound of coke and coal.

July

2,204,870 lb. of metal charged.
187,816 lb. of coke burned.
13,650 lb. of hard coal burned.
9,720 gal. of oil used.

This gives a total of 10.94 lb. of metal per pound of coke and coal.

It would, of course, be possible to make comparisons on iron melted for manganese steel blows, but we cannot spare the extra time and attention, to say nothing of the laboratory work that would be needed to make these comparisons. When we are making ordinary carbon steel

*From a paper presented at the special meeting of the American Foundrymen's Association, Milwaukee, Wis., Oct. 7 to 11, 1918. The author is metallurgist, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

we analyze, of course, for phosphorus and sulphur but on manganese steel the sulphur content is so small as to be negligible and we accordingly use up the poorer cars of pig iron and scrap on manganese steel charges, and we also use the higher sulphur coke which it seems impossible at the present time to keep out of our shop. It is these conditions and the fact that we, like other foundries, are more than busy in making deliveries that prevent our giving more definite data as to the possibilities of the process.

New European Steel Projects

The information below concerning iron and steel prospects in Norway, Finland and Chile comes from our London correspondent:

Great things are expected from the recently returned exploration expedition to Spitzbergen. Vast deposits of 60 per cent iron ore are reported to have been discovered and enormous coal seams, cannel, bituminous and anthracite. Plans are now going forward for putting up large iron and steel works there. The promoters, the Northern Exploration Co., are very sanguine and talk of getting the blast furnaces up by next year and the steel works by 1920, but it is hardly likely that this program can be adhered to.

Two new companies have just been founded in Finland in which the Krupps are interested. The Jussaro Gruva A. B. is to take over and extend the iron mines of Fishars A. B. and A. B. Dalsbruck. The capital is 2,000,000 marks. The ore, which is said to be rich, is to be smelted at the Krupp works. Another company for prospecting all over Finland is the Finlands Malmundersoknings A. B., capital likewise 2,000,000 marks. The Krupps are to supply the experts, but do not hold the majority of shares.

It is probable that the Altos Hornos de Corral in Chile, owned by French capital, which has been idle for several years, will be put in operation again.

Priority Rating for Fittings

WASHINGTON, Nov. 4—To make possible the speedier getting out of the transoceanic steel steamers which the Emergency Fleet Corporation has launched, the War Industries Board has ordered a priority rating for these fittings which will take precedence over every other demand except the urgent demands of the navy itself.

This is made necessary by the demand for these large steamers to take care of the program announced by the General Staff to have 80 divisions in France next spring. For this purpose, it is found that the smaller steamers are of little use, as they cannot coal enough on the other side for the return voyage. It has been found that many of these ships, after they are launched, must wait for boilers and other fittings, and that these delays are particularly costly at this time. After a conference attended by Chairman Hurley of the Shipping Board, Chairman Baruch of the War Industries Board and Secretary of War Baker, it was decided that only radical steps will avail. As a result the War Industries Board has promised the fleet corporation that it will give an immediate priority order for any boiler or other fitting, no matter who has it, that will be needed for these ships. Only the immediate demands of the navy will take precedence over these priorities.

At the same time, Chairman Hurley has announced an important change in the policy of the Shipping Board and the Emergency Fleet Corporation. Except where contracts are actually under way, no more small ships are to be built. The future demands ships of 10,000 deadweight tons and over.

Work of completing the United Steel Company's plant at Lowell, near Everett, Wash., is being rushed. A 12-in. bar mill is being installed, and a large blast furnace is in course of erection.

R. H. Beaumont & Co., manufacturers of coal, ash and coke handling equipment, have moved their headquarters at Philadelphia from the Drexel Bldg. to 315 Arch St.

Canadian Shipbuilding Program

C. C. Ballantyne, Minister of Marine and Fisheries, Canada, announced Nov. 1 that supplementary contracts have been placed with the several shipbuilding yards in the Dominion for the construction of 31 steel ships, ranging from 3400 tons to 8100 tons deadweight capacity. In addition, plans and specifications for a larger type, of 10,500 tons, are in course of preparation, and it is expected that contracts for the construction of several will be placed in the near future. The first launching under the program will take place from the yard of the Canadian Vickers, Ltd., Montreal, toward the middle of November, when two vessels—one of 4300 tons and one of 8100 tons—will take the water. It is expeced that they will be ready to proceed on their first voyage before navigation closes on the St. Lawrence. The keel of the smaller vessel was laid March 31, while that of the larger was laid July 13. The Minister states that he fully expects to have the whole 31 ships, aggregating 175,000 tons, in commission before the end of next year.

While the price being paid for these vessels is substantially higher than the price paid in Great Britain, the Minister points out that they are being constructed at prices that compare favorably with those being paid for similar types in the United States. He states that plates and shapes, which are at present obtainable only in the United States, are being purchased for the same price as is being paid by the United States Government, and although substantially lower than prices obtained in the open market, they are materially higher than prices heretofore ruling in Great Britain. As the result of the difficulties experienced in securing supplies of plates, the Minister says that he has become more convinced of the soundness of the policy adopted by the Government of providing for the manufacture of ship plates in Canada. For some months previous to the Government's decision to engage in shipbuilding, private firms for whom ships were being built in Canadian yards were paying prices for plates ranging from $100 to $180 per ton, and several lots had to be purchased for upward of $200 per ton. Through the courtesy of the United States Government, the Department was enabled to obtain an assurance that sufficient plates to meet the requirements up to July or August, 1919, would be available from United States sources at the rates fixed by that Government, namely, $65 per ton.

It was in these circumstances and in pursuance of a policy to make Canada self-contained in the matter of shipbuilding that the arrangement was concluded with the Dominion Steel Corporation for the erection in Sydney, N. S., of a plate mill and the purchase therefrom of 250,000 tons of ship material at a basic price of $83 per ton. The contract with the steel company provides that the price of plates will be reduced proportionate with any reduction that may hereafter occur in the cost of producing steel ingots. This cost will be determined at the end of every six months' period by auditors selected by the Canadian Government for the purpose.

The Thomas Spacing Machine Co., with main office in the Fulton Building, Pittsburgh, and works at Glenshaw, Pa., a suburb of Pittsburgh, is building an addition to its plant at a cost of $100,000. Part of the equipment has been purchased and some of it already delivered and installed. The plant is modern up to date in every way; the buildings are of steel and fireproof construction. The company builds the Thomas spacing tables along with a line of multiple punches and other shipyard and structural steel and boiler shop equipment. The officers of the company are: George P. Thomas, president; J. S. M. Phillips, secretary and treasurer; F. C. Stiening, chief engineer; J. H. Keefer, superintendent.

The spring meeting of the American Electro-Chemical Society will be held in New York City. The next fall meeting will take place in Chicago in conjunction with the Fifth National Exposition of Chemical Industries, heretofore held each year in New York.

The Prevention of Growth in Gray Cast Iron*

Causes of the Phenomenon—Effect of Entrance of Oxidizing Gases and the Formation of a Case—Application to Dies and Permanent Molds

BY J. E. HURST

THE phenomenon of growth or expansion of gray cast iron when subjected to repeated heatings in an oxidizing atmosphere has been shown to be due to the increase in volume consequent upon the internal oxidation of the various constituents by means of the gradual penetration of the oxidizing gases into the center of the gray cast iron mass; while it has been shown that the whole of the constituent silicon is comparatively rapidly completely oxidized, and the total growth experienced is roughly proportional to the extent of silicon present in the original iron.

Cause of the Growth

The primary cause of growth is the presence of the free graphite plates which allow of the entry and penetration of the oxidizing gases into the interior of the iron. It has been experimentally shown that in those white cast irons in which free graphite is absent, the total expansion is almost negligible, and for the most part can be accounted for by the precipitation of free carbon in the nodular annealing carbon form.

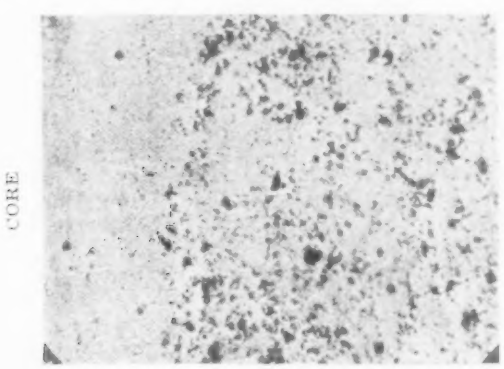


Fig. 1—Photomicograph, Unetched Sample, of the Decarbonized Surface on Gray Cast Iron. Magnification is 75 diameters

It is of considerable importance to note that malleable cast irons in which the free carbon exists in the nodular form of annealing carbon do not grow. This is the result of the fact that the graphite in these irons does not present a continuous path for the penetration of the oxidizing gases into the interior of the mass.

On these grounds, therefore, it will be readily appreciated that any method whereby the entrance of the oxidizing gases into the interior of the casting is prevented will simultaneously prevent growth. Methods in which the outside surface of the material is coated with a layer of impervious refractory enamel readily suggest themselves as a means whereby the entry of the oxidizing gases may be prevented. Apart from the difficulty of obtaining a suitable enamel, such methods would entail many disadvantages in the majority of circumstances.

The removal of the free graphite from the exterior surface layers of the cast iron would appear to be an ideal method for preventing the penetration of the gases. Such a method would amount to the production of a skin or case of decarbonized material round the cast iron which would effectually prevent the entry of the gases. By this means growth would be prevented, and the use of alternative white irons which involve difficulties in machining obviated.

Effect of a Protecting Case

An example has been recorded in the shape of a length of gray cast iron water pipe, 4 in. in diameter and about 3/16 in. in thickness, which was prevented from growing by the formation of a protecting case. The pipes were repeatedly maintained at a temperature in the region of 800 and 900 deg. C. alternatively for a considerable period in a strongly oxidizing furnace atmosphere. The chemical composition of the cast iron was as follows:

	Per Cent		Per Cent
Combined carbon	Nil	Silicon	2.66
Total carbon, by combustion	2.20	Manganese	0.46
Graphite	2.20	Sulphur	0.096
		Phosphorus	0.95

This analysis was taken from the material after exposure to the heat, the low total carbon content being due to the unavoidable inclusion of drillings from the decarbonized portion of the iron. It was found on examination of the silica precipitate from the silicon estimation that the whole of this precipitate was quite white and flocculent. This is confirmatory evidence of the absence of internal oxidation.

On fracturing the iron, the inner core of gray graphitic iron, surrounded on both sides by a case having a bright steely fracture, was rendered plainly visible. Photomicrographs taken from a section cut from this pipe are illustrated in Figs. 1 and 2. In Fig. 1, the unetched sample, the completeness of the decarburization and the almost entire removal of the graphite plates are clearly shown. In the etched sample, Fig. 2, small traces of nodular areas, consisting possibly of carbon in the annealing carbon form, are revealed in the case. It is extremely interesting and important to note the existence of the phosphide eutectic constituent in the decarbonized case. This constituent was evenly distributed throughout the original material. In the interior of the heat-treated specimen the graphite appeared to exist in a finely divided, possibly annealing, carbon form. The presence of holes was also noted, as would be expected as a consequence of the removal of a portion of the phosphide constituent. Many of the larger black areas in the interior, as shown, were apparently filled with finely divided carbon. There is no doubt that the heat-treated sample was somewhat more brittle than the normal metal; but in spite of this, it is very important to note that the heat-treated iron possessed none of the rottenness associated with "grown" irons.

Previous to exposure to heat these pipes were heavily coated with a thick scale of rust (hydrated ferric oxide). It is considered that the initial presence of this scale has largely contributed to the decarbonization. In his repeat experiments the author has met with success by prolonged annealing in this material.

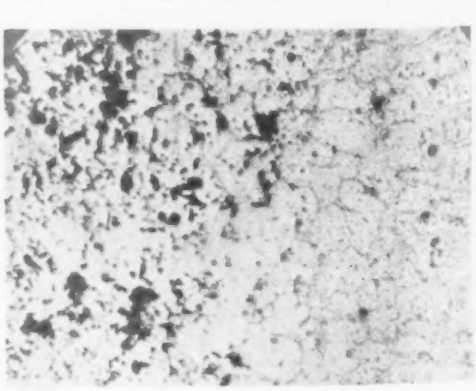


Fig. 2—Photomicograph, Sample Etched in 1 Per Cent Nitric Acid, of the Decarbonized Surface on Gray Cast Iron. Magnification is 100 diameters

*From a paper presented at the fall meeting of the Iron and Steel Institute in London, England, Sept. 12 to 13, 1918.

The possibility of the complete removal of the graphite plates and the entire absence of spaces where the graphite originally existed when heat treated under oxidizing conditions is clearly proved by the photomicrographs. So far as the author's knowledge goes, this observation is entirely new.

Method of Removing the Graphite

The possible methods by which graphite might be removed without the subsequent production of cavities in the metal are briefly summarized below:

Superficial decarburization and the oxidation of the graphite followed by the liquation of the phosphide eutectic into the remaining cavities.

At temperatures of over 900 deg. C. within the range of temperature to which the above-mentioned samples have been exposed (900 deg. to 1000 deg. C.) it is certain that a considerable portion of the graphite is redissolved, forming the austenite solid solution.

In those irons containing considerable quantities of phosphorus the conditions are considerably more complex, but there is every probability of the re-solution of the graphite taking place with the production of complex ternary constituents. Under these circumstances the possibility of the removal of the graphite with the entire absence of holes will be appreciated.

Further investigation is necessary before a complete explanation of the mechanism of the surface decarburization can be satisfactorily given. It appears extremely probable in this particular case that decarburization of the superficial layers of the austenite

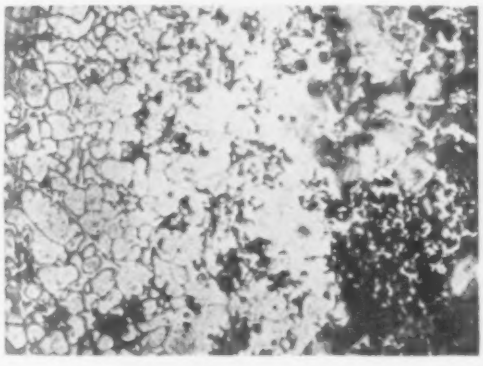


Fig. 3—Photomicograph, Sample Etched for 45 Seconds with Stead's Cupric Chloride Reagent of the Decarbonized Surface on Gray Cast Iron. Magnification is 100 diameters

in direct contact with the heavy scale of ferric oxide primarily takes place. The austenite solid solution, in addition to the carbon originally existing as combined carbon possibly contains some of the graphite dissolved, and in this manner the graphite is removed from a superficial layer and the entry of the oxidizing gases prevented.

The original analyses of the above-mentioned specimens are not known, but it is legitimate to assume that the original carbon contents of this class of casting would be as follows:

	Per Cent
Total carbon	3.25
Graphite	2.75
Combined carbon	0.50

It will be seen, therefore, that about 1 per cent of the total carbon is removed by oxidation, and this is very probably all removed at the high temperature, while in the austenite condition, by the gradual diffusion of the austenite towards the decarbonized portions. This assumption is borne out by heat-treatment experiments on a similar class of iron, in which it has been shown that when quenched from a temperature of 900 to 950 deg. C., over 1 per cent of carbon can be retained in the dissolved austenite form (*Journal of the Iron and Steel Institute*, 1916, No. II). The presence of carbon in the annealing carbon form noticed in the core of the specimen is also additional proof of the fact that the graphite has been redissolved and reprecipitated in this form on slow cooling.

It is of considerable importance to note the diffusion of the phosphorus in this particular sample. Fig. 3 is a photograph of a similar specimen to the above-mentioned etched with Stead's cupric chloride reagent. As will be seen, the whole of the decarbonized case is entirely unaffected by the reagent, showing that, in addition to the binary eutectic, a considerable amount of the phosphorus of the sample exists in solid solution in the decarbonized case.

It is considered in this particular instance that the diffusion of the phosphide is for the most part a secondary phenomenon. The phosphide will commence to dissolve as the concentration of the austenite solid solution is gradually reduced, and, as has been shown by Dr. Stead, the dissolved phosphide will tend to diffuse to the decarbonized portions (the outside edges) and will tend to become concentrated in those portions.

Application to Permanent Molds

It will be appreciated that the production of a decarbonized case around cast-iron articles in this manner will be of considerable service in the prevention of growth under many circumstances. It has already been suggested that this method should find application in the protection from growth of dies and permanent molds for iron and non-ferrous metals. Other important uses suggest themselves, such as the protection of valve seatings and valve guides in internal-combustion engines. For this purpose further experimental work will be necessary to accurately determine the conditions under which this graphite can best be removed.

The author has several permanent molds which have been protected in this manner by annealing at a temperature of 900 to 950 deg. C. in ordinary brown rust (oxide of iron) for a period of 72 hr. The results have also been considerably improved by raising the annealing temperature to 975 to 1000 deg. C. Troubles, however, have been experienced in these cases through distortion. At this high temperature from the preliminary investigations already made, the removal of the graphite would appear to be brought about throgh the formation of the ternary eutectic of iron, phosphorus, and carbon, and in this respect is somewhat different to the above-mentioned case.

The author expresses his regret that, owing to the lack of time and materials, he has been unable to investigate this phenomenon as thoroughly as it deserves. There is every possibility that, when fully investigated, it will be of considerable service in the direction mentioned.

Mr. Ford Favors Eight Hour Day

WASHINGTON, Nov. 5—As umpire for the National War Labor Board, Henry Ford has decided in favor of the basic 8-hr. day in the case of the International Association of Machinists vs. the Wheeling Mold & Foundry Co., Wheeling, W. Va. The decision provides also for the payment of time and one-half for overtime, and double time Sundays and legal holidays.

"But I can not refrain from expressing my very deep conviction," continues Mr. Ford in his letter to the board, "that the straight 8-hr. day is much better practice than the so-called '8-hr. basic day,' where the latter is continually and almost uniformly being practically exceeded in the number of working hours.

"My experience, and also my reason, teaches me that very few emergencies ever exist in a manufacturing business, justifying the practice of exceeding eight working hours per day. The strain of eight hours is enough, and the hours should never be increased except under the most extraordinary circumstances. I cannot dwell too much on this. For the good of the men—for the good of the employer—and for the general results, I would admonish those interested to adhere to the straight 8-hr. day."

Operations have been resumed at the blast furnace at Midland, Ontario, formerly owned by the Canada Iron Corporation which, after having been closed five years, was taken over last spring by a company composed of Cleveland, Duluth and Midland capitalists, of which James Playfair, Midland, is president and general manager. The daily capacity is 150 tons. The company has 60,000 tons of ore and 10,000 tons of coke on hand.

Improving Foundry Sand Mixtures

Use of Sand Mixing Machine —Time Required for Mixing— Effect of Sea Coal and Fire Clay

BY HENRY B. HANLEY

IN these times it is exceedingly important to reduce the cost of foundry sand mixtures, not only by decreasing the amount of new sand used but also by increasing the quantity of old sand that can be used over again. Sand preparation has only recently received the attention that it deserves, probably because other problems occupied the attention of the foundrymen and were considered more important from the standpoint of the quality of the castings and the cost of production.

There is no doubt that ultimately ways and means will be found to use up all of the old sand; also, that the old cores will be broken up and used over again. Furthermore, unless the foundry is so small that it cannot afford the expense, it is absolutely necessary to employ a metallurgist or chemist to experiment with the different kinds of new sand, to investigate the possible reduction of binder for core sand with the use of cheaper binder than was formerly used, and generally to supervise the more thorough and more economical preparation of molding sands. It is believed by many engineers who have studied the subject that the most satisfactory means of mixing is by the use of a muller type of machine, provided that the mulling action does not destroy the original structure of the sand, but simply incorporates the various ingredients into a uniform mixture, at the same time maintaining its original porosity.

Locating the Mixing Department

It is important properly to locate the sand mixing department, so that the new sand can be delivered as automatically as possible into the mixing machine, and to take away the resultant mixture quickly and economically, thus securing the maximum capacity from the mixer. Also, where one machine is used for both facing and core sand, it should be located so that the core mixture and the facing mixture can be transported to wherever they are to be used in the foundry with as little delay and expense as possible. Likewise, the return of the old sand to the machine should be kept in mind, so that the expense of so doing will not counteract the advantage of using up the old sand. It is important that the sand be distributed so that the molders will not have to wait at any time for a fresh supply of sand.

Accurate records should be kept of various mixtures required for certain classes of work and the cost of such mixtures be proportioned per ton of castings. In other words, the cheapest mixture that can be used in any particular class of work should always be determined, and then this particular mixture should be absolutely maintained.

The time of mixing should be very carefully investigated, as in core sand especially it is just as bad to mix the sand too long as not long enough, as more expense is necessary in continuing the mix beyond the time required. I have heard a great many foundrymen make the statement that poor sand preparation is responsible for more lost castings than any other cause.

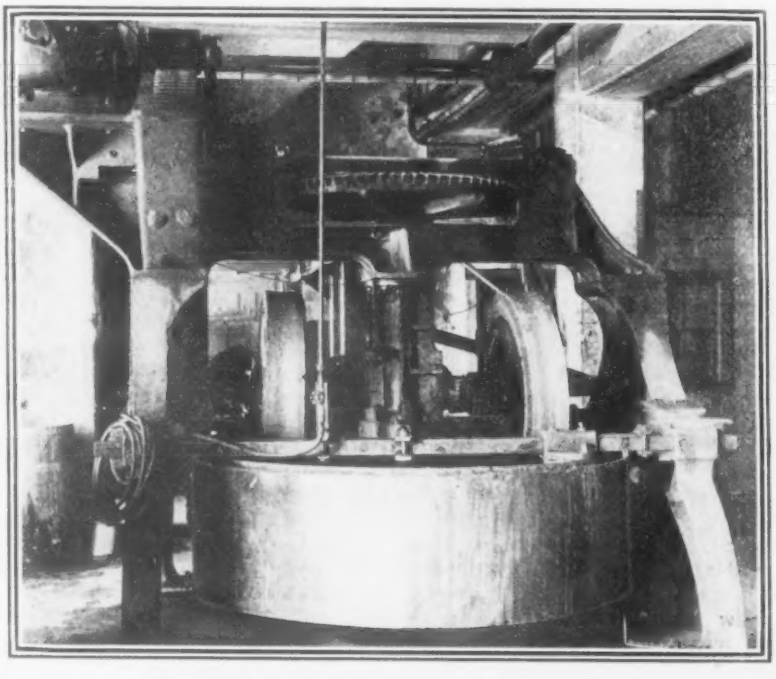
It is also possible with the muller type of mixer to secure a good distribution of sea coal particles for facing, and to decrease the amount of sea coal that is required. Consider the immense saving in time effected by the molder in finishing the mold that is made with well mixed sand; the mold will not fall to pieces so easily and therefore requires less finishing. The metal will not cut into the mold because the sand presents a tougher exterior. It is not difficult to note the difference, by observation in the cores of the rough, loose edges where the sand is not properly mixed. These edges, of course, are liable to wash off and the pieces get to the top of the casting and cause trouble in the machine shop, resulting in scrapping of the castings.

Where a foundry uses mostly green sand it is all the more important to prepare it properly, especially where there is a variety of castings of both heavy and medium weight. In such cases mixtures of sand can be produced with small additions of binder and sea coal that are quite economical. On the other hand, mixtures are required with much stronger bond and more careful manipulation. It is oftentimes desirable to arrange for various bins for the different mixtures, so that there is no chance of using a mixture that is not adapted to the particular class of work to be done.

Another valuable use of the sand-mixing machine is that very tough sand can be cheaply made for large copes because less sea coal is needed and the cope part of the mold is not so apt to scab; also the cope is much less liable to drop out, as is often the case with poor facings.

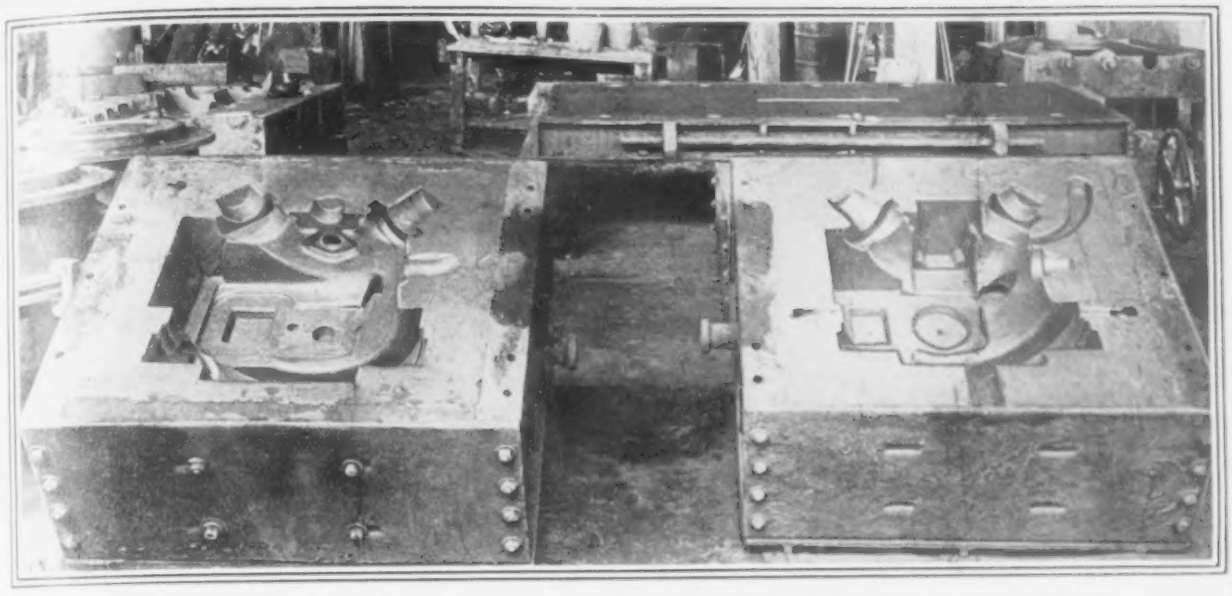
Description of Equipment

The illustration shows a large cylindrical pan 7 ft. in diameter, with sides 12 in. in height. The mullers are supported on steel shafts which are independent of each other. The ends of these shafts are provided with shoes which move in guides in the frame. The muller shafts are supported by heavy steel springs which may be set in such a position that the mullers are close to but not in contact with the muller plates when the pan is empty. The space between the mullers and the muller plates can be adjusted to suit the blending requirements. A mechanical unloader permits emptying while running.



Sand Mixing Machine of Muller Type

*From a paper read Oct. 11 before the American Foundrymen's Association. The author is with the New London Ship & Engine Co., Groton, Conn.



Cylinder Head Mold in Which Reclaimed Facing Sand Was Used

In our experience with the muller type of sand machine, we found it important to make a careful adjustment of the mullers so that they do not rest on the pan. In this way there is little danger of grinding the material to a powder. On the other hand, if the muller is in contact with the pan a continuous grinding goes on which is harmful for any sand. In the first place, the grain size and grade of the mixture is altered and the whole mass is broken into fine, sharp particles. When such sand is dumped out, it does not feel right, is weak and very sharp. With proper attention to the position of the muller excellent sand can be obtained at all times in not exceeding five minutes' time of mulling. This will give the maximum bond for the mixture used. Mulling for three minutes will give nearly the same bond as five minutes. The ultimate bond is dependent on the mixture used, the temper, the revolutions per minute and the time.

Influence of Additions of Sea Coal

While conducting a number of tests on green sand facings that contained sea coal, we were surprised to find that the sea coal had a serious effect on the bond. Tests were made to determine to what extent sea coal could be used in good facing and still have the bond required for safe working. A mixture was made of old sand 60 per cent and new sand 40 per cent, no sea coal being used. The molds were blacked, and the casting came out fine. Next, 3, 6 and 9 per cent additions of sea coal were tried. On passing 6 per cent the bond was so seriously weakened that quite poor castings were produced. All of these mixtures were prepared in the muller previously described and were mixed in five minutes' mulling. After a careful investigation, it was learned that the sea coal breaks up the continuity of the bond imparted by clay or impurities. This weakness attributed to sea coal could easily have been overcome by additions of more new sand, but since this means increased cost for facing it was decided to adopt the safe working limit of 6 per cent for facing intended for medium weight castings.

Reclaiming Old Sand

In selecting molding sands, we have tried to secure strong bond sands at all times. We find there is economy in the purchase of these strong bond sands because they will go further than a sand of weak bond in adding to old sand or in making a facing. One can appreciate the effect of adding 10 per cent of extra strong stove plate sand to the heap sand, when to begin with the stove plate sand selected for this work contains double the bond of other sands. There are some advantages about reclaiming old sands with strong bond new sands, that should appeal to those who do not have a muller. It is not so difficult to mix thoroughly the two sands as it is when the mixture of clay is undertaken.

To make clear the influence of selected strong bond sands for reclaiming purposes, our experience has been that they are economical and safe in plants where there are no means of controlling the reclamation work, such as tests that show exactly what the bond and other qualities are.

Reclaiming Sand with Ordinary Fire Clay

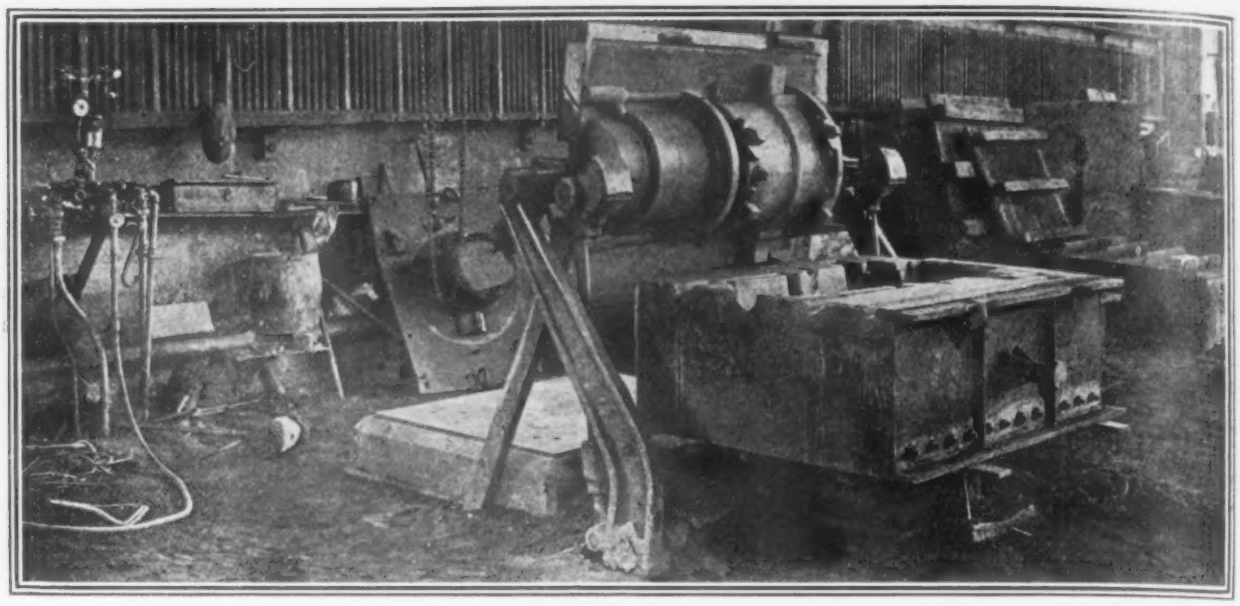
We have found that fire clay is not suited to molding sand work for the simple reason that it takes too much clay to develop the bond when added to old sand. The reason for this is the fact that fire clay does not possess any amount of plasticity but is generally nonplastic. We have found additions of 10 per cent fire clay a serious detriment in sands intended for facing, because with the clay in the old sand plus the added clay which made a total of 20 per cent, troubles in venting and blowing developed. On cutting the fire clay addition down to 5 per cent, the troubles were eliminated, but the bond was not reliable. If the molds dried out from long standing the cope would drop from weak bond. When mullers were first introduced for sand reclamation, it was thought possible to take any foundry clay, add old sand, and make new molding sand. This idea is disappearing, because the knowledge of clay to-day shows that there is a great variety to select from, each having a different bond and plasticity. Excellent results are obtained when the proper clay is chosen for the work, as the following table indicates:

	Ordinary Fire Clay	Selected Plastic Clay
Bond absorption figure	2000	12,000
Transverse strength	15 lb. per sq. in.	275 lb. per sq. in.
Clay substance plus impurities, per cent	96 per cent	98 per cent

In selecting the clay to be used, a strong bond plastic clay should be specified. As the table shows, practically the same amount of clay is used, but its quality and its influence on the ultimate strength or bond of the sand being reclaimed will differ enormously. This has been explained previously and is due to the superior physical quality and not the chemical quality of the selected plastic clay.

Reclaiming Sand with Selected Plastic Clay

When one changes from the use of ordinary fire clay to a strong plastic clay and attempts to rejuvenate the old sand, an entirely different result is obtained. With the plastic clay, a good strong bond that is reliable is secured. Only a small amount, 5 per cent or sometimes less, is required to develop an excellent feeling in the worn-out sand. This is a tempting line of investigation because it offers a considerable return, on account of the great economy possible. Backing sand for heavy work needs nothing more than a small amount of plastic clay and a few minutes in the muller. When one considers the vast differences in properties of clay that are



Method of Molding with Improved and Reclaimed Sand

suitable for this line of work, it is easily understood that the future advances will be made not by using the ordinary fire clay but the selected plastic clay.

Method of Adding Clay to Sand Mixtures

It is still a matter of argument between foundrymen as to the best way to blend sands in order to get the best results. Some prefer the dry mixing method and then tempering; others prefer to mix and temper at the same time. Our experience has shown that wet mixing in a muller develops about all we expect from the ingredients. We have had the best results by adding clay in the form of emulsion, while the machine is in operation. This allows the clay to spread over the surfaces and avoids lumps in the mixture. It is entirely a matter of clay dispersion over sand surfaces that makes ultimate bond. We all know that a liquid condition for the added material is superior to the dry condition. By mixing the clay with water we can develop the maximum amount of bond with the minimum amount of clay.

Utilization of Local Sands

When we have a muller at our disposal, we find that it is thoroughly practicable to utilize some of our local sands by adding 25 per cent to our new facing sand mixtures. In this way we are saving 50 to 75 per cent against the cost of new molding sand brought from long distances. A good mixture for medium weight castings can be prepared in a muller by taking 50 per cent old sand, 25 per cent local sand, 23 per cent of new sand and 2 per cent of selected plastic clay. It is of importance, however, to first know that the local sand is of refractory character. It matters not whether it contains clay or other bond; this can be put into the mixture at will.

Quality of Work with Reclaimed Sand

The quality of the work produced is the main consideration in sand reclamation. The results obtained so far are decidedly in favor of mechanical treatment of the sand. When a mixture is found satisfactory for a certain line of work it can be duplicated, thereby giving each molder the same quality of sand. This avoids the personal equation where each man thinks he is better prepared on his own facing requirements than the next one. We have seen hundreds of important castings come exactly the same in surface appearance day after day. They were not made from exactly the same formula for sands but the texture and bond were what was required for the job. In order to have complicated castings free from sand defects it is necessary to give the sand mixing some study.

Rolled Bayonet Favored

WASHINGTON, Nov. 5—So successful and satisfactory have been the preliminary tests with a rolled bayonet, recently submitted, that the Production Division of the Ordnance Department has recommended the letting of a contract for 300,000 of the new type. The rolled bayonet saves approximately 70 operations in manufacture and, of course, by just this much would, when quantity production is reached, speed up the output. Five hundred and fifty of them were recently tested at the Bridgeport plant of the Remington company, the tests proving highly satisfactory.

Bayonets, as at present made, require a series of operations, machining, hardening and tempering of drop-forged steel, which to a great extent are done away with by the rolling process. It is estimated that, in addition to the saving in time, there would be a material reduction in labor requirements, as, with equal factory equipment, only about one-third the labor would be required to turn out the same number of finished bayonets.

The Chicago offices of Frederick Cowin & Co., Joliet, Ill., manufacturers of merchant bar iron, have been removed from 4201 South Halsted Street to 76 West Monroe Street.

Exporting Steel to Italy

WASHINGTON, Nov. 4.—The War Trade Board has announced that licenses for the exportation of steel for Italy will be granted hereafter only upon receipt of satisfactory evidence that the steel will be transported at a rate of freight not exceeding the rate established by the United States Shipping Board, which is $67.50 per ton of 2240 pounds, or 40 cu. ft., ship's option, on pieces and packages not over 4480 pounds. This rate applies upon the following commodities: Structural iron and steel, iron and steel shapes, plates, nails, bolts, nuts, sheets, plain and corrugated; plain and barbed wire, billets, bars, rails and fastenings, pig iron, and pipe. This ruling does not apply to applications for licenses to ship steel purchased by the British, French or Italian governments.

Army ordnance representatives held a conference Oct. 22 at the Cincinnati Chamber of Commerce, with manufacturers and foundrymen in the Cincinnati district. Major E. A. Custer of Pittsburgh, representing the Ordnance Department, explained that it was the Government's purpose to utilize surplus foundry equipment in the making of semi-steel shells, but no statement has been made regarding the extent to which this is to be done in and around Cincinnati.

Iron-Ore Supplies of Alsace-Lorraine*

Their Control and the Future Peace of Europe — Fuel Supply of France — Germany's Iron and Coal Resources

BY SIDNEY PAIGE

ABOUT six months ago [about December, 1917] I became interested in the Alsace-Lorraine matter from the standpoint of the policy of the United States in its relation to these areas, and the possible peace between the Allies and Germany. I feel that ultimately the problem of solving this difficulty must rest, at least I hope it will rest, on geologists, engineers, metallurgists and technologists.

Never before, perhaps, in the history of the world has the policy of a great nation been fraught with more momentous consequences than is the policy of the United States at present. To any thoughtful man impressed with the velocity of modern civilization, it must be evident that "direction" of movement is of vast importance, if the best interests of humanity and of that which is best in modern civilization are to be preserved and fostered. It is a significant fact that to-day there remains no great unpopulated territory. The great resources of the world are known. No longer may nations cramped by expanded industrial systems seek relief without upsetting the industrial balance of the entire world.

There are two great aims in this war, and their importance justifies any sacrifice. First, the arrogant, autocratic, military despotism of Germany must be crushed. Our second aim has to do with such redistributions of resources and territory as will tend to preserve peace and lead to the normal industrial progress of nations. And it is in this connection that the iron ores of Lorraine are involved.

The position of the United States is unique. Her resources are the greatest in the world; her peoples are imbued with the virility of all great peoples, and her position geographically with respect to trade is, to say the least, remarkable. She lies between Europe and Asia. Great trade routes will meet and pass through her territory. It is well recognized that without the iron ores of Lorraine, Germany could not have waged the present war; and therefore that if these ores be taken by force of arms peace will follow almost at once.

It must be recognized at once that in Lorraine (leaving Alsace out of the discussion for the moment) the contiguous France, there is to-day the greatest iron ore reserve of Europe. No single factor, perhaps, no group of facts involved in this war, deserves more thoughtful consideration. Upon the proper disposition of these reserves, upon the nature of the barriers that may be set up or torn down in their utilization, upon the spirit of co-operation or competition which enters into their disposal, depends in large measure the future peace of Europe.

It is of interest to analyze briefly the present situation with respect to Alsace-Lorraine. It has been the battle ground of Europe ever since the days of Caesar when, in 72 B. C., a German tribe invaded this territory and settled down. It is useless except for moral discipline when feelings of self-righteousness become acute to dwell upon the number of times this fair territory has changed hands. Enough, that in 1871, France lost half of it to Germany. And it is significant to note that before this date it belonged wholly to France, left to her by the preliminary agreement of Versailles at the end of the Franco-German war, but that the German geologist, Hauchcorne, pointed out to Bismarck the potential value of this area, and France was persuaded to cede a strip of it by the subsequent treaty of Frankfort in exchange for land of military value near the fortress of Belfort. Geologists, therefore, were already, in 1871, of use to their governments at war. Since that time any lack of foresight on the part of French geologists has been corrected. They realize to-day the value of Alsace-Lorraine.

Germany's Iron and Coal Resources

Coal and iron are so important in modern war, and the Germans, so well supplied with certain other necessities, are so ingenious in devising substitutes, that a consideration of such other necessities must take second place. Germany has vast resources in coal but poor resources in iron; but if the resources of Lorraine be included the resources of Germany in iron become vast. And if there be included French territory now held, she possesses the greatest resources by far, on the Eastern Hemisphere. Of a production of 28,600,000 tons of iron ore in 1913 by Germany, 21,000,000 came from Lorraine; of coal Germany, without French territory, possesses more than half the resources of all Europe. England follows her in resources, Russia next, then Austria-Hungary, and fifth comes France. The Saar Valley alone contains more coal than is known in France to-day. One does not need a vivid imagination to picture the strength of this combination which at present she commands, the greatest coal and iron resources of Europe.

France, on the other hand, is deficient in coal. In iron, before the war, her resources were only slightly less than those of Germany, and of a total production of 21,700,000 tons by France, 19,500,000 came from the Longwy-Briey field, the identical field from which Germany draws her main supply.

Briefly then, what was the situation before the war? Simply this: Germany, by unparalleled activity in the development of great coal resources, was using not only all the iron ore she could command, but importing an increasing amount year by year from France. France, on the other hand, short of coal, was importing some 23,000,000 tons and exporting iron ore to the amount of one-tenth of the production of the Longwy-Briey field, to Germany.

Fuel Supply of France

Let us now turn to the war aims of French geologists and metallurgists. DeLaunay foresees France at the end of the war "triumphant, happy. * * * We impose our wishes, we impose them completely. I do not consider any other hypothesis as possible, as worthy of discussion." And the conditions that he expects to be imposed include not only the restitution of Alsace and Lorraine, but the annexation of sufficient German coal and coal fields to redress the mineral deficiencies of France.

In 1913 France produced 40,000,000 tons of fuel, while her consumption reached 60,000,000 tons. A deficit of 23,000,000 tons, therefore, growing year by year, required imports from England, Germany and Belgium to supply her needs. Of coke, which is the principal element entering into the cost of pig iron, the situation before the war was even more unfavorable. The 3,000,000 tons which were imported approached the figure of domestic production.

As has just been said, France before the war faced a deficit each year of 23,000,000 tons of fuel. This figure represents 19,000,000 tons of coal and 3,000,000 tons of coke (4 tons of coal to produce 3 tons of coke). Lorraine alone produces 4,000,000 tons of coal but no coke, and consumes 6,000,000 tons of coal and 4,500,000 tons of coke (made from 6,000,000 tons of coal). A total of 12,000,000 tons of coal, therefore, is consumed

*Paper in a symposium on "Certain Iron Ore Resources of the World," prepared for the meeting of the Iron and Steel Section, American Institute of Mining Engineers, at Milwaukee, Wis., Oct. 9, 1918. The author is with the U. S. Geological Survey, Washington, D. C.

in Lorraine, while this territory produces only 4,000,000 tons. There is a deficit, therefore, of 8,000,000 tons of coal in Lorraine. Therefore, if Lorraine is returned to France, the deficit of that country in coal will rise from 23,000,000 tons to 31,000,000 tons. The French, therefore, propose that they also be given the coal of the Saar Valley in Germany. Should this wish be realized, the consequences are as follows: The Saar Valley produces 10,000,000 tons of coal, which is consumed crude, and 3,000,000 tons of coal, which is made into coke, 13,000,000 tons in all. This region consumes 5,000,000 tons of coal (2,000 000 as crude coal and 3,000,000 transformed into coke). There is a surplus, therefore, of 8,000,000 tons of coal, that is to say, precisely the amount deficient in Lorraine.

Lorraine and the Saar Valley

But this apparent balance of resources takes on a different aspect when analyzed with respect to coke. Lorraine and the Saar Valley together produce, as set forth above, 17,000,000 tons of coal, divided as follows:

Coal consumed crude	14,000,000 tons.
Coal made into coke	3,000,000 tons.

This territory likewise consumed 17,000,000 tons of coal, but this amount is divided thus:

Coal consumed crude	8,000,000 tons.
Coal made into coke	9,000,000 tons.

Now, while the deficit of 23,000,000 tons which France faced before the war will not be augmented if Lorraine and the Saar Valley are taken, her situation with respect to coke will be worse. Before the war the 23,000,000 tons deficit of France was divided as follows:

19,000,000 tons of crude coal.
4,000,000 tons of coal for coke.

With the new arrangement these figures will become:

13,000,000 tons of crude coal.
10,000,000 tons of coal for coke.

The importations of metallurgic coke into France in 1913 were divided as follows:

	Tons
From Germany	2,393,000
From Belgium	547,000
From other countries	130,000
Total	3,070,000

There is therefore a deficit of nearly 7,000,000 tons of coke which France must make up by import. The Saar Valley does not produce good coking coal and France wants coking coal, not coke, for she wishes to obtain the by-products. England, before the war, consistently refused to send coking coal and would sell only coke. France after the war will be forced to buy fuel. Where can she buy coking coal? And just here the basic principle is illuminated that nations must co-operate.

French Steel Output

If the situation in France with respect to ore is examined, assuming that she possess, after the war, Lorraine and the Saar Valley, it will be found that she faces an equal predicament—that is, a market for her ores. This is clearly set forth in the analysis by Robert Pinot.* But the crux of the matter is reached when the situation with respect to the manufacture of steel is analyzed.

France in 1913 produced 5,311,000 tons of pig iron; 957,000 tons were consumed by French foundries or exported crude. The remainder, 4,354,000 tons, was made into iron and steel. Lorraine and the Saar Valley in 1913 produced 5,241,000 tons of pig iron, of which 4,502,000 tons were transformed into steel. France after then would have a capacity of 11,000,000 tons of pig iron, of which 9,000,000 tons would be made into steel. Furnaces erected during the war would supply another million tons of steel. France thus would be compelled to dispose of 10,000,000 tons of steel. Where would this steel go? It may be shown that, even if a roseate view is taken of the French industrial situation after the war, France will be in a position (always assuming that she possesses Lorraine and the Saar Valley and ample coal from Germany) to produce 4,000,000 more tons of steel than she can dispose of. Pinot estimates as follows:

	Tons
French consumption before the war	8,000,000
Lorraine-Saar consumption	4,000,000
Exportation and reduction of temporary importation	6,000,000
Total	18,000,000

Four million tons approximately remain unaccounted for.

In 1913 Germany exported	6,500,000 tons of steel.
In 1913 England exported	5,000,000 tons of steel.
In 1913 United States exported	2,500,000 tons of steel.
In 1913 Belgium exported	1,700,000 tons of steel.

France cannot hope to develop exportation at the expense of the United States, a country which has enormously increased her capacity during the war. Nor can she hope to compete with Great Britain, who will, after the war, be in a strong position metallurgically. And as for Belgium, she will have some 1,184,000 tons for export. Again, therefore, the French are driven into competition with the Germans.

Pinot outlines a plan and presents figures, to the end that Germany lose her markets. There is no need to review these figures here. Their importance lies in the fact that this entire question deserves the most painstaking research on the part of the United States, England and France, that some equitable basis for peace may be reached.

The analysis above brings out clearly the need of an economic policy with regard to the disposal of the Lorraine and contiguous French ores. It must be constantly borne in mind that this iron-ore reserve is of supreme importance to all the great industrial nations of Europe. If the war is concluded with the military autocracy of Germany victorious, there is no need of further thought to this matter. Such a Germany will see to it that an enslaved Europe will pay tribute.

I will close in repeating one sentence. Upon the proper control of these resources, upon the nature of the barriers that may be set up or torn down in their utilization, upon the spirit of competition or co-operation which enters into their disposal, depends in large measure the future peace of Europe.

*Pinot, Robert: La Metallurgie et l'apres guerre. *Bulletin et Compte Rendus Mensuels, Société de l'Industrie Minerale*, 1re livraison de 1917.

Reducing Output of Ammunition

WASHINGTON, Nov. 5—The Ordnance Department has announced plans for a further reduction of 50 per cent in the present output of commercial ammunition. At the same time, however, the war authorities are anxious that a reasonable percentage of plants for commercial manufacture retain their working organization. The War Industries Board has requested that recommendations be submitted as to the restrictions to be imposed upon commercial cartridge manufacture and the recommendation has been submitted for a further cut of 50 per cent of the present output.

The Federal Tool & Alloy Steel Corporation, successor to the Swedish Iron & Steel Corporation, New York, announces that the latter has always been an American concern, owned and operated by Americans. Prior to May, 1915, it had been exclusively an importer of Swedish iron and steel products, but later began to enlarge the scope of its business to that of a merchant distributer of American iron and steel products, as well as a distributer of swedish iron and steel products. In the extension of this policy in 1917, the Federal Tool & Alloy Steel Corporation was incorporated and both companies are now consolidated under the name of the Federal Tool & Alloy Steel Corporation in order more correctly to denote the character of the business.

The National Engineering Co., manufacturer of Simpson sand mixers and other foundry equipment, on Nov. 1 removed from 5 North La Salle Street, Chicago, to the Machinery Hall Building, 549 West Washington Boulevard.

Recovery of Potash from Blast Furnaces*

Possibilities of Electric Precipitation from Gases—High Potash of Southern Iron Ores — Recovery from Blast Furnace Slag

BY LINN BRADLEY

POTASH recovery is becoming of more universal interest to the public as well as to the technical man. The British Government has furnished large sums of money to assist in recovering potash from the iron blast-furnace gases. It is predicted that this source will enable England to obtain enough potash to equal her entire pre-war importation from Germany. France is reported to be as keenly awake to the possibilities along this line, and we may see the time when France will be recovering large quantities of potash from iron ores which Germany has made such strenuous efforts to control.

First Potash Recovery in This Country

After the installation of the Cottrell processes at the plant of the Riverside Portland Cement Co. in California was placed in operation for the purpose of eliminating the dust nuisance, it was noticed that the material collected in various parts of the precipitator differed in fineness. The alkalies found present increased with the fineness of the material as shown by screen analyses. Thus the first commercial potash recovering plant in this country was established.

Early in 1912 the Research Corporation of New York started to develop the Cottrell processes and apply them to various plants in the eastern portion of the United States. Shortly after work had been begun a paper was read and a demonstration given at a meeting of the local section of the American Chemical Society near Allentown, N. J. The next day arrangements were made for a visit to the South Bethlehem plant of the Bethlehem Steel Co. Having in mind the experiences of the Riverside cement plant, curiosity was aroused by the appearance of the gases coming from the tall brick stack connected to the boilers. An investigation was undertaken by R. J. Wysor, superintendent of blast furnaces of that company, and this resulted in extensive investigations thereafter to determine the possibility of cleaning these gases by the Cottrell processes and recovering whatever of value could be obtained from the collected material. Mr. Wysor published an able and valuable article in the *Transactions* of the American Institute of Mining Engineers (1917) [THE IRON AGE, Jan. 18, 1917] giving a great deal of data on the recovery of potash as a by-product of blast furnaces. His paper probably served as an inspiration for much of the work which has been undertaken abroad.

Furnace Conditions and Potash Recovery

Analyses of iron ores, cokes, limestones and dolomites show a wide variation in potash content. It is therefore advisable for one to make sure that his raw materials are sufficiently rich to warrant a potash recovery plant. Furnaces which produce a large tonnage of slag per ton of iron on account of the iron content of the furnace charge will, of course, carry more potash into the slag than furnaces which produce a relatively small volume of slag, other things being equal except for composition of the charge. Some iron ores carry as high as 60 per cent of iron and are practically devoid of potash. Some cokes have a low ash and are low in potash. Some limestone and some dolomites may be quite pure. If, therefore, the ores are uniform and properly prepared and the fuel and flux are properly proportioned, the slag volume will be small and the potash in the gases may likewise be negligible.

On the other hand, if the iron ore carries as much as 2 or even 1 per cent of potash (K_2O) and the coke ratio is high and it and the flux contain as much as 0.25 to 0.50 per cent of potash, quite a large quantity of potash will be volatilized and carried off by the gases from which it can be recovered. The high temperature in the blast furnace and the length of time under treatment allow the silicates to be decomposed more readily than in a cement kiln where the temperatures are not so high. The potentialities of the by-product recovery from blast furnaces would, therefore, seem to surpass the possibilities of the Portland cement industry in this regard.

High Potash in Alabama Ores

Since the investigations referred to were begun at South Bethlehem, numerous other furnaces have been studied and potash balances made. Iron ores have been found in abundance in Alabama which carry from 1 to as high as 3 per cent in potash and carry enough iron to make them highly suitable for this purpose. Table 1 shows the results of one investigation.

Table 1—Analyses of Alabama Iron Ores

Material	Fe	SiO_2	Al_2O_3	CaO	MgO	Ash	Carbon	Na_2O	K_2O
Ore No. 1	46.36	17.42	4.19	5.03	8.33	....	....	0.62	1.27
Ore No. 2	54.69	12.78	3.49	4.04	6.60	....	....	0.39	0.74
Stone	....	1.56	0.58	46.24	7.25	....	....	0.64	0.26
Coke	....	5.82	3.49	0.51	0.24	13.01	86.15	0.39	0.32

Charged into Blast Furnace

Material	Lb. per Ton Iron	Total Lb. K_2O	Per Cent of Total
Ore No. 1	3,115	39.56	61.0
Ore No. 2	1,168	8.65	13.2
Stone	1,440	3.74	5.8
Coke	4,050	12.97	20.0
Total	9,773	64.92	100.0

Summary

Total K_2O charged into furnace per ton of iron produced, lb.	64.92
Lost in slag per ton of iron produced, lb.	11.60
Lost as fume from gas leaks per ton of iron produced (estimated), lb.	1.16
Total potash recoverable from gases per ton of iron produced, lb.	52.16
Total potash in dust in gases as per analyses, per cent	34.11
Water soluble potash in dust in gases as per analyses, per cent	32.10
Portion of total potash in dust, which is water soluble, per cent	94.10
Total water soluble potash recoverable per ton of iron by collecting the dust in the flue gases, lb.	49.60
Total water soluble potash as above per 500 tons iron per day, lb.	24,545
Total water soluble potash as above per year of 350 days, tons	4295.37
Portion of total potash charged into furnace which is recoverable from gases in water soluble condition, per cent	75.62
Safe estimate of above amount recoverable in operating practice, per cent	80.00
Safe estimate of above amount recoverable as above per year of 350 days, tons	3436.20

A study of these figures will show that it is desirable to keep the potash content of the raw materials up to the highest point and to keep the slag volume and potash content as low as possible. It is clear that if the slag volume remained constant as well as its analysis, and that if only 11.6 lb. of potash had been contained in the furnace charge, there would have been nothing available for collection. With suitable slag volume and potash content and a rich potash charge the recovery of potash in quantities worth while is readily obtained.

*A paper read at the Fourth National Exposition of Chemical Industries, New York, Sept. 25. The author is with the Research Corporation, New York.

Effect of Salt in the Charge

Sodium chloride has been found helpful in liberating the potash in such way that it is recoverable in the dust in a water soluble form. While working at a cupola furnace in which sash weights were made from old tin cans and other metals waste, it was found that the use of common salt or sodium chloride greatly increased the fume volume and density, and this later was shown to be due to the fact that chlorides of lead, tin and zinc were formed and readily volatilized as such. The use of salt has been extended to cement kiln practice and to other uses in connection with the recovery of silver, lead and zinc from low grade ores and tailings, the values being recovered from the gases after volatilization as chlorides.

Consideration of data such as presented in the tables given below resulted in an effort being made to find raw materials suitable for making iron and yet carrying high percentages of potash. Samples of ores, fluxes and cokes were obtained from a number of furnaces and other sources, and later on this work was carried on much more extensively by the Bureau of Soils of the Department of Agriculture. It is probable that Frederick Brown of that Bureau has now collected data on nearly all of the raw materials available for iron making, and that if such data were made public in the near future it would be of great assistance in connection with the problems under consideration.

Economic Importance of Southern Ores

Personal efforts to find materials such as described developed the fact that in the eastern part of Alabama there is a very large tonnage of iron ores carrying in some cases an average of 1 per cent of potash and in other instances an average of about 1.80 per cent of K_2O, several analyses showing a content of over 3 per cent K_2O. I am indebted to Dr. J. S. Grasty for having brought these ores to my attention and for much of the data on their iron and potash content as given later in this paper. M. W. Bush, president Shelby Iron Co., has also contributed data on the iron situation of the South and the values of these iron ores in furnace operations. I have examined these properties and have interviewed blast-furnace operators who have used them in their furnaces and hold the opinion that they constitute an asset of importance to the nation as well as to interested parties. They should receive the consideration of the Government in connection with our war problems and likewise our post-war problems, so as to assist in rendering our country absolutely independent of Germany.

Table 2—Potash Recoverable from Southern Ores and Blast Furnaces

Contents:	Coke	Stone	No. 1 Gray	No. 2 Red	No. 3 Brown
Silica, SiO_2, %.....	8.7	2.0	19.2	15.0	19.5
Alumina, Al_2O_3, %.	5.0	1.0	4.6	4.0	3.8
Lime, CaO, %.....	0.3	53.0	1.3	17.0	6.0
Potash, K_2O, %...	0.3	0.3	1.8	0.2	0.2
Iron, Fe, %.....	1.7	0.0	19.8	36.0	42.0
Ore required for 1 ton iron, lb..			4398	6039	5212
Percentage of burden.....			46.07	54.35	46.87
Coke required for 1 ton iron, lb.			2700	3900	3000
Percentage of burden.....			28.29	35.22	26.98
Stone required for 1 ton iron, lb			2448	1159	2909
Percentage of burden.....			25.64	10.43	25.15
Total potash content of burden per ton iron, lb.....			99.5	29.57	33.97
Deduct for losses in slag and elsewhere, lb.			10.4	15.6	14.0
Total potash collectible from gases, lb.			39.1	13.97	19.97
Slag volume per ton iron, lb.			2715	3290	3090
Total potash in gases per day (100 tons iron)			44,550	6985	9985
Total potash in gases per 350 day year, tons			7796	1222	1747
Assume 80 per cent recovery, this equals			6237	978	1406
Value per annum at $500 per ton of K_2O			$3,118,500	$489,000	$703,000
Value per annum at $100 per ton of K_2O			$623,700	$97,800	$140,600

The ores carry an average of from 48 per cent to 52 per cent of iron, are very uniform, easily mined and shipped as they are directly on the railroad, and operate satisfactorily in the furnace, producing good iron at low cost. Their potash content also acts as a desulphurizer, thus improving the grade of iron. The phosphorus content is very low.

Table 2 has been compiled to show the economic importance of these ores as a source of potash, the figures having been based on experience at several other furnaces as well as on the data obtained in connection with these particular ores and at various iron furnaces in the South. The table has been submitted to experienced iron blast-furnace operators for suggestions and criticisms. For comparison, other ores have been included in the table. The composition of the high-potash iron ore has been taken from the average of over one thousand tons of such ore shipped to furnaces on which K_2O was determined for each car of this particular shipment.

The total production of pig iron in this country is such that about 200 furnaces of such size as referred to in Table 2 would be required to meet our requirements if the furnaces were of the same capacity. So it is easy to see that we now have sufficient furnace capacity to produce annually over 1,500,000 tons of potash per annum, far in excess of our pre-war requirements. The difficulty lies in the fact that we have not found that all furnace burdens carry the amount of potash shown under column No. 1.

If the furnace charges and operations could be adapted so that one-fifth of the amount, or 300,000 tons, could be produced, this would meet our needs without assistance from any other source. The three constituents of the charge, ore, stone and coke, contain more or less potash. By using those raw materials which carry more than usual amounts of potash, our recoveries can be considerably augmented. In cases where ores are smelted which are excessively limey, feldspar, potash-bearing slate or other potash-bearing silicates could be fed into the furnace and thus increase the potash content of the furnace burden.

Potash from Blast Furnace Slags

H. E. Brown, chemical engineer, New York, has developed a process for making a special cement from the slag obtained from a blast furnace and at the same time recovering water soluble potash from the gases. He charges limestone, coke and feldspar into the furnace. If iron ores of suitable kind could be used for a portion of the raw material, it might be possible to produce potash from the gases, also pig iron, and a slag which could be readily converted into a marketable cement. As the market varies with the supply and price, the furnace charge could be varied so as to increase the potash and reduce the iron or vice versa. The process has been developed to the extent that both potash and the special cement can be produced, but investigations looking to a reduction in the operating cost have not been completed.

Governmental Co-operation and Assistance

In France and in Great Britain the national governments have taken an active interest in the possibilities along the lines herein pointed out. It has been reported that investigations, extending over a period of three years, have shown that Great Britain can produce enough potash to satisfy all her requirements. The British Potash Co., Ltd., has recently been organized for this purpose, and the British Government has undertaken to provide at least half of the total capital required. The funds necessary for the enormous scale operations contemplated will be more than an individual would be anxious to supply in these times. Another reason is that the British Government is fully awake to the importance of potash to their national interests.

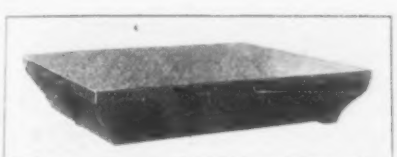
It does not seem that our own Government should falter or lag behind in this field, but on the contrary should immediately make comprehensive plans and take energetic action of such a character as will insure the proper solution of the problems under discussion. At

the present time individuals shy at putting their money into a new enterprise which requires much labor and material without having adequate assurance that their efforts will meet with success. In order to do this, the full and continuing support of the Government must be had. Surely this situation should be corrected promptly.

It seems ridiculous that the United States should be playing the role of food granary for ourselves and our allies, also raising the cotton which is so necessary in connection with the war, and yet nothing is being done to provide the potash either for food purposes or for the cotton, except the limited and inadequate efforts due to private initiative.

A Bench Plate for the Inspection Shop

A new form of bench plate has been brought out by the Simplex Tool Co., Woonsocket, R. I. It is designed for use in connection with the laying out and inspection of machine parts and special tools.



Heavy Construction and Reinforcing Ribs Characterize a New Bench Plate Designed Especially for Use in Connection with the Laying Out and Inspection of Machine Parts and Special Tools

As will be noticed, the plate is of heavy construction with numerous reinforcing ribs, both of which tend to insure the accuracy of the plate and guard against distortion. Two sizes of plate measuring 12 x 14 and 20 x 30 in. respectively can be furnished. The top surface of the plate is finished in a planing machine, or if desired plates having a scraped surface can be supplied in both sizes.

An After-War Reconstruction Convention

WASHINGTON, Nov. 4.—Although the Government is still side-stepping the problem of after-war reconstruction, the Chamber of Commerce of the United States has called a convention of 300 industrial war service committees to be held in Atlantic City Dec. 4, 5 and 6. The chief topic at that conference will be the question of reconstruction. The program is in the hands of the war service executive committee of the Chamber. The meeting will bring together from 2000 to 3000 industrial leaders to discuss the problems of war as well as those which will arise at the end of the war. It is expected that the conference will result in creating a federation of all the war service committees for a closer cooperation with the Government. For nearly a year the Chamber has been engaged in directing the organization of war service committees in all lines of industry to assist the Government in mobilizing most effectively the country's industries for prosecution of the war. "It is evident," says the call for the conference, "that, however far away the end of the war may be, it is necessary to begin to outline a general program of organizing business for the period of reconstruction."

Questions foremost at this time in the minds of every business man will be discussed at the conference by the best authorities that can be assembled. Speakers who already have accepted invitations to appear include Secretary of Commerce William C. Redfield, A. C. Bedford, James A. Farrell and Paul Warburg. The conference will include general sessions at which questions common to all industries will be taken up, sessions of committees within particular industries at which specific industrial problems will be discussed, meetings of related war service committee groups, and conferences of individual war service sessions. The main conferences will be held on the Million Dollar Pier.

W. L. C.

Temperature Measurements in Foundry Drying Ovens

An interesting article on temperature measurements in drying ovens appears in one of 1918 issues of *Stahl und Eisen*. The author draws attention to the fact that many bad castings are caused by improper drying of molds. The moisture remaining in the molds is changed to steam by the incoming metal when pouring the castings and may cause the outer layers of the mold to spall off. Also the steam causes the production of gas that often remains in the metal in the form of blow holes. On the other hand, it sometimes happens that the molds are heated too much and do not possess the needed strength to meet the rigid requirements in the foundry. The reason that proper means have not been used to control the drying of the molds is probably because it is possible to make good castings in undried or green sand molds. Dried molds, however, have many advantages over the others. They are absolutely necessary for castings of large size or great height, for green sand molds offer too little resistance to the ferrostatic pressure.

For successful drying the time in the ovens is also of great importance. The place where the special thermometers or pyrometers are to be placed naturally depends on the type of oven, but arrangements should be made so that the readings are available near the source of heat so that the temperature can be easily regulated. The very important question of what temperature to use cannot be answered directly, as it depends largely on the binding agent used. For resin and pitch, 175 deg. C. should be used; for flour and starch, 175 to 190 deg. C.; for sulphite-lye, 200 deg. C., and for oil binders even higher. If gas or crude oil are used for heating, it must be remembered that their combustion produces water vapor, so that a higher temperature must be used than when using coke.

In a general way the following temperature limits can be given. For lean sands with which carbohydrates (flour, starch resin, pitch) are used as a binder, 100 to 150 deg. C.; with oil as a binder this should be raised to 200 to 250 deg. C. For large molds and loam the limits are between 250 and 350 deg. C., and for fire-clay molds for steel castings the limits should be between 400 and 600 deg. C.

It is very harmful to bring the temperature up too quickly. First the water must be driven out, and then the binding agent vaporized or decomposed. For the first object the temperature should be about 120 deg. C., and when this has been accomplished the temperature should be raised to the limit desired. It is well to equip the thermometer or instrument used with signal lights which will show when the limits are reached.

The author mentions that the methods of control outlined above are particularly valuable now in Germany because they tend to offset the bad castings liable to be made by the poorer labor available, the new and poorer binding agents, and because of the need of the highest efficiency possible.

G. B. W.

Promoting Sanitation in War Plants

WASHINGTON, Nov. 5—The Bureau of Public Health Service has created the office of "Industrial Sanitation and Medicine" to carry out the terms of a presidential order giving that bureau jurisdiction over all inspections and investigations pertaining to the health of war workers and to plant sanitation in establishments engaged in the production of war materials. By order of the Chief of Ordnance, responsibility for investigating into mechanical safety in plants engaged in ordnance production has also been given to the Bureau of Public Health Service and delegated to the office of industrial hygiene and medicine.

The Patterson-Kelley Co., Philadelphia, manufacturer of feed-water heaters and related specialties, has removed its local office to the Harrison Building, Market and Fifteenth streets. Frank F. Glenn, district sales manager, will be in charge.

International Trade After the War

Important Changes in Export Demand in the Past Four Years Due to New Industrial Alignment—Food Problems Will Hold Back Factory Reconstruction

BY STERLING H. BUNNELL*

EVEN while all energies of American manufacturers have been devoted to winning the war as quickly and thoroughly as possible, the evident approaching success of our combined effort has forced us to give attention to the anticipation of after-war conditions. Next to war work, the most popular topic for trade conventions and technical press is the development of American export trade. Interest in the creation of foreign demand for our manufactures has been awakened by an energetic campaign of education. Banking facilities have been provided for financing transactions requiring many months for completing the transfer of the goods from domestic manufacturers to ultimate foreign consumer. Shipping and marketing facilities are being developed to reach all parts of the world. The creation and development of foreign markets for our industrial products is generally represented as dependent only on the active interest of American manufacturers and export agents in advertising and pushing the sale of their goods in foreign countries, and there seems likely to be no lack of such activity.

Nothing is more certain, however, than that there are greater forces than advertising and salesmanship in creating a demand for goods. The hungry man does not need to be urged to buy food, but will seek out the place where he can get it. A market for woolen clothes can hardly be created at the equator, and it is proverbially foolish to carry coals to Newcastle. Accordingly, the development of export trade should not be considered solely from the point of view of the domestic manufacturer who wants to sell his regular product abroad, but rather should follow a broad study of the markets which are likely to be open, the articles required in those markets, and the possibility of manufacturing and delivering those articles at competitive prices.

War Changes in Exports

The effects of over four years of war conditions extend into every continent of the globe and have caused tremendous changes in export trade possibilities. During that period every country has been forced to undertake the production of every possible article previously obtained by importation, or to find substitutes for imported goods, or contrive ways of getting along without them. Industries have been organized where there were none, and their products already supply their domestic markets. Other industries have been converted to war work, or stopped and disintegrated from lack of raw materials or transportation. The principles of international trade remain the same, but the old figures of exports and imports between countries will be of little value in studying the opportunities of developing new markets for our industries.

The general effect of the war on world activities has been to increase industrial output and decrease food production. At the same time the labor supply has been reduced, and large populations have been transferred from country to country. The intensity of production of military necessities has not only reduced the supply of articles of mere luxury, but has caused a serious shortage in production of the necessaries of life. While exact figures are not available, it is a reasonable estimate that 30,000,000 people in the temperate zones have been withdrawn from the production of food, which means an enormous decrease in the supply of grain and meat, animal fats, hides and skins, and other products. The United States, formerly a distinctly agricultural nation, gradually becoming rather an industrial people, has enormously increased the output of its factories and works. While we still export large quantities of grain, such export is made possible only by reason of the voluntary saving by our own people in order to supply food to an army comprising already more than 2 per cent of our whole population, and including a much larger percentage of our workmen normally engaged in production. It is probable that in the near future we shall import more food than we export. Our surplus production will certainly be in manufactured articles rather than in foodstuffs.

Large Food Exports First

In Europe, leaving aside consideration of the effect of the loss of lives in the war, changes have been brought about which will probably never be reversed to the extent of reproducing pre-war conditions of international trade. All central Europe, with the neutral countries adjoining, has been underfed for many months, particularly in fats. The Allied countries also have undergone privation, though in less degree. The destruction of the industries of Belgium and northern France, with the flight and later the removal of a large part of the population, makes it impossible for the export of manufactured products from those countries to be resumed in the near future. But as many of those unfortunate people as are still alive will be more than ever dependent on food produced in other countries.

The end of the war will release a large amount of ship tonnage from carrying munitions, and make it possible to transport available foodstuffs from other continents to Europe. Presumably our Allies will first see to the needs of their own population, and next will supply the neutrals who have suffered from the stern necessities of Allied blockades. Afterward, the famine situation of the people under the control of the Central Powers must be dealt with. Evidently, in view of the demands which will come upon the scanty supplies of food, the increase of the world's food resources is the most important business of the period after the war is won.

Trade with the Far East

Food production requires land and labor, and its increase must come from the use of that combination, wherever it exists. Clearly, Siberia with its land and labor, and China with its labor and land, can be of immense importance in relieving

*Chief engineer, R. Martens & Co., Inc., New York.

the scarcity. Nowhere else on the earth is there available such a combination of man power and land, now most ineffectively employed. High prices and an active market for grain and meat will cause rapid development of agriculture in the Far East. Such a development will in turn cause a demand for agricultural machinery, tractors, farm implements, and household utensils and hand tools for the home life of the farm workers. Clothing and boots or shoes of the kind in use by the Siberian peasants will be necessary to replace those worn out in four years of deprivation through the stopping of imports. Building supplies, such as nails, sheet roofing, sheet metal, hardware, locks and builder's tools, will be required to provide new homes for the increasing population of Siberia, where thousands of immigrants, driven from the war zone, are living with the poorest sort of shelter. Portable sawmills and engines can be used to advantage, and brick making machines for districts where suitable clay is found. Motor trucks and trailers will be needed to supplement deficient transportation, and these will stimulate a desire to build tolerable country roads by American road-scrapers, and surface them with crude oil where it is conveniently available, as in portions of Siberia. Dairy, creamery and butter-making equipment, abattoir machinery and by-product manufacturing apparatus, and modern tanning and leather working machines will be required. In short, all kinds of machinery which will facilitate food production will be needed in those countries having land and labor available for agricultural development.

Fat Shortage in Europe

In Europe, the shortage of fats has become so extreme that about 40 per cent of the population of the world has been reduced to a ration of one-eighth to one-fourth of the normal. The nations affected are principally those which derive their supplies of fat from animals, and the shortage is a direct result of the decrease in cattle and sheep through slaughtering to obtain high prices for the meat and hides and avoid loss through the scarcity of fodder, and also because the armies have taken the men needed for tending the animals. It will take years to restore the numbers of animals to pre-war figures. Meanwhile, enormous quantities of fats must be obtained for food purposes. Evidently vegetable oils must supply the place of the animal products which are wanting. Cocoanut oil, cottonseed oil, bean and nut oil, and other products of either the tropics or the Far East will be in great demand. Manufacturers using fats as raw material will be directly interested in the import trade, and so indirectly in the return export trade with those parts of the world. Machinery and equipment for obtaining and manufacturing vegetable oils, fats, candles, soap and other products, and barrels, cans, and metal for making them can be sold abroad as a consequence of the increased demand for vegetable oils.

New Demand for Agricultural Implements

The grain shortage must be made up principally by agriculture in Russia and Siberia. Before the war the Russian Empire exported 40 per cent of its grain crop. Last year, in the absence of any authoritative figures, it was estimated that Russia's production (including Siberia) was less than half of the normal domestic requirements. For the season of 1918 the production is undoubtedly much smaller. No wonder that famine exists in every city in Great Russia, and scarcity even in the grain-growing centers in Ukrainia. The cause of the under-production is as much the exhaustion of agricultural implements and spare parts for repairs, as the disorganization and anarchy which affects the cities rather than the scattered population of the rural districts. The normal imports of three years before the war would be required to restore agricultural production in Russia to its former condition. Via Vladivostok and the Trans-Siberian Railway, it would have been impossible to do more than supply the needs of Siberia alone.

The opening of the Dardanelles and the following access to Russian Black Sea ports will bring Ukrainia within easy reach of American Atlantic ports, and open the Russian market to our agricultural implements, chemicals, insecticides, household supplies, clothing, boots as far as leather or substitutes are available for export, and all kinds of hand tools and small machines for village trade workers. The result of exporting these goods to Russia will be the desired increase in food production. If the process of refitting Russia is sufficiently rapid, we in the United States may escape the scarcity that all Europe must continue to experience until the balance is restored between food production and consumption, for we may soon be relieved of the necessity of sharing our grain and meat with the nations across the sea.

It must not be forgotten that America has no monopoly on the export of manufactured goods to Europe and Asia. Every nation of industrial importance has been engaged in the war, and therefore has increased its manufacturing facilities to the utmost. The end of hostilities must release the output of the factories of all Allied countries for export, but only as far as there is a surplus over the needs of the home population resuming its civilian activities. At first, the shortage caused by years of war conditions will tend to absorb most of the output and leave little for each country to export. But as the importance of export trade is recognized by every national government, efforts will be made in every manufacturing country to export a portion of the production, and competition will begin immediately. The advantage in quantity available for export will be with the United States, but the advantage in cost of production may lie against our country.

Factory Restoration Will Not Be Rapid

The universal increase in the manufacturing equipment of every country is a fact of the greatest importance in affecting the development of our export trade. Evidently, the world has too many factories and too many industrial workers. Though many of the industries are for war purposes only, at least a part of them will be converted into producers of civilian supplies. With such a surplus of factory hands and deficit of farm labor, the construction of new factories would be unwise, and particularly so if such factories were to be located in places where workers are not present.

Apparently, the restoring of the industries destroyed or removed by the invading Huns is an economic impossibility for the present. Those inhabitants of the devastated districts who were able to escape have taken up some sort of occupation elsewhere, and to return them, rebuild their homes, refit their industrial plants and provide markets for their productions will be extremely difficult at the time when industrial over-

production exists in all countries and every effort should be given to increasing the production of food. It is more than probable that the industries of other countries have permanently absorbed many of the refugees of the war, and that the devastated districts will take up their life again as agricultural rather than manufacturing countries. In that event, export trade to those countries will be in farm implements and homebuilding supplies, instead of machine tools and industrial equipment, and the restoration of the factories will be left to a later period when readjustment can be made gradually.

Later Machinery Developments

The good old law of demand and supply may be depended upon to force the inhabitants of the world to increase their food production as quickly as possible, and to limit all factory output not directly useful to that end. But it is entirely possible to look beyond immediate needs to the future, when each nation profiting by past experience will make itself as nearly self-sufficient as possible. Cotton-growing peoples will build textile factories to supply their needs of cloth, industrial nations will arrange for permanent supplies of raw materials under their own control and protection, and agricultural countries will invite the establishment of implement factories in their principal centers. These developments will afford opportunity to transfer surplus industrial plants to places where they are needed, and will provide openings for engineers to locate in new places and design and construct improved plants in ideal locations. The net result will be reduction in transportation expense, saving in labor, and therefore increase in human comfort. But manufacturers need not worry over impending competition from plants to be established in what is now export territory, for it will take many years to reach the ideal condition where each nation manufactures all its own requirements.

American ingenuity is likely to be active forever in devising new and better machinery and methods, and in replacing the old by the new in other countries as well as in our own. Part of our capital may as well be employed in Russia or China, earning dividends for its owners, as in earning the same amounts in America. We have learned by the war that we cannot safely depend on the oceans to make us independent of the actions and ideas of the rest of the world. If we like our own ways of living, we must share their advantages with other nations, and give them the opportunity of learning and peacefully adopting them if found good. American capital and enterprise devoted to the upbuilding of industry in China, Siberia and Africa will spread the ideals for which we have been forced to raise a huge army and devote our mightiest effort, and may prevent the development of another attempt to chain mankind to the chariot of an emperor "by divine right."

High Labor Costs

Other conditions of enormous importance are going to affect the development of our trade both abroad and at home, and their effect is at present impossible to forecast. Wages and costs of production have risen enormously, including also the cost of food, and all countries have had the same experience. Apparently the worker has a large surplus of wages over living expenses, but this is in part due to greater thrift under war restrictions and stimulus, and in part to the fact that more members of the family are likely to be earning wages. The result is that money buys less than formerly, and this inflation is apparent in all countries. Even the silver-using countries, which have been least affected by the war, are experiencing a similar inflation from the rise in the value of silver, which affects them internally not at all, but has the effect of marking up the gold values of their exports. It is probable that American workmen produce as formerly more by the aid of our mechanical methods than the workmen of other countries, so that we may still be able to sell some of our products in competition with the world. But readjustment of prices is sure to come in time, and should employers and workers be unable to agree on a reasonable basis, we might well be in for a very serious setback that would take years to overcome.

The extent to which women will remain in trade work is also an unknown quantity at present. Some undoubtedly will gladly return to their home occupations, while others will desire to continue their independence as wage-earners. Probably a considerable proportion of women now working at occupations formerly given only to men will continue to be wage-earners, so that the proportion of women to men in the industries will show an increase over pre-war conditions. If the same proportion holds in other countries, the effect on export trade competition will be unimportant.

The Soldier in Industry

The immediate result of the return of the soldiers is perhaps the most indeterminate quantity of all. Some men believe that the soldier will gladly return to his old job, and others think that the life in the open, in presence of great events, will make it impossible for the soldier to go back in contentment to work bench or desk, and will drive him as a rover to new scenes. Probably a good proportion of soldiers will have gained much in initiative and self-reliance, and will gladly undertake work in new fields, developing industries in foreign countries. For work in connection with export trade, men with army training must have great superority over all others not actually experienced and trained in export business. The return of the soldiers should provide a supply of men idealy fitted by their experience to display the necessary tact, adaptability, initiative and force of character to make friends in foreign countries and develop a market for American manufactures.

Need of New Study of World Conditions

The technic of export trade has been discussed at conventions and in publications until everything has been said over a dozen times, and is impressed on the minds of all enterprising manufacturers and business men. There is no difficulty in obtaining competent advice and direction in every detail of export trade development. Before the direct attempt to develop business is begun, the manufacturer should try to determine whether the changing conditions of world affairs will provide a demand for his product, and where that demand will be. If the product is essential to the necessities of human life and comfort, its sale on a large scale will be possible and profitable. Otherwise, it would be better to change the product to something that is needed. Very many factories have been converted for the manufacture of some necessity for winning the war, and more will be changed in due time to supply civilian

that a large outlay has been caused by the fact that the Army and Navy each maintains a complete staff of accountants, so that, for example, in the North Elmwood plant of the Curtiss Company where both Army and Navy work is being done there are two sets of Government employees at work in all branches of cost-plus accounting under the respective contracts."

Buying in the United States for the Australian Arsenal

Mention was made in THE IRON AGE some weeks ago of the arrival in New York of J. K. Jensen, secretary of the Australian Arsenal, whose mission to this country is in connection with the expansion of munitions and ordnance manufacture in Australia. The following official statement is made concerning this important undertaking:

"The Australian Government, which already possesses factories for the manufacture of arms, explosives, harness, saddlery and leather accoutrement, clothing and woolen cloth for the use of its naval and military forces, has decided to establish a complete arsenal in which all classes of munitions required by the field army will be produced. It will include machine guns and ammunition for field guns, which comprises brass cartridge cases, fuses, shells and high explosives. Aeroplane and gun factories, including gun carriages and vehicles, and light howitzers will also be taken up. In addition there will be a small arms ammunition factory to supplement the factory now being operated by a private company in Melbourne. Complementary to the establishment of the arsenal it is intended to organize the engineering and manufacturing industries of Australia for the production of munitions in time of war. The arsenal is primarily to be a form of insurance against war and a training ground for the industries of Australia, upon which in time of war the chief burden of producing munitions will fall.

"Special attention is to be devoted to building a town adjoining the works. This is to be laid out on the most modern principles to insure best conditions for the workers. A complete estimate of the cost has not yet been made, but the Australian Government expects that it will be more than $10,000,000, and about five years has been allotted for the completion of the work. Committees composed of experts employed by the Government and managing leadings industries in Australia have been appointed to advise the Government in carrying out the undertaking. The managerial staff of the arsenal has been appointed, and members are at present touring England and the United States with a view to obtaining the latest information in these countries to assist Australia in placing the arsenal on the most efficient basis, especially in the light of experience gained in the present war."

Mr. Jensen's present headquarters are at the American office of the Australian Department of Trade and Customs, 44 Whitehall Street, New York.

Chicago Machinery Club

The Machinery Club of Chicago, under the leadership of E. P. Welles, president Charles H. Besly Co., has started a drive for the acquisition of 500 new members. The work will be conducted by about 50 teams, each of which has a captain, with a "colonel" or member of the board of directors, in charge of a group of teams. Mr. Welles has worked out the plan on military lines. A member securing five new members will be designated an ace and given a prize, while there is provision also for double, triple and quadruple aces. Daily luncheons are to be held at which reports will be received, and it is expected that the club will go "over the top" within a week. Non-resident as well as resident members are sought.

The club has been the headquarters for workers in the various Liberty loan and other "drives" and has made a creditable showing. It is the view of President Frank Adkins, of Adkins, Young & Allen Co., and his associates, that the home of the club in Machinery Hall, Washington Boulevard and Clinton Street, should be made the machinery center of the Middle West.

Book Reviews

Powdered Coal as a Fuel. By C. F. Herington. Pages xi +211, 6 x 9 in.; illustrations, 84. Published by D. Van Nostrand Co., 25 Park Place, New York. Price, $3.00.

A timely discussion of a process rapidly gaining in recognition of its advantages. It is the author's avowed purpose to compare various patents, designs and systems and to consider claims without bias or prejudice in order that the merit of each may be recognized and intelligently gaged. The subject is clearly and comprehensively covered, aided materially by numerous diagrams and illustrations of apparatus and installations.

After an interesting comparison of the first cost and yearly operating cost of a screw conveyor coal plant, pneumatic powdered coal plant, fuel oil and water gas plants, the author discusses coal suitable for powdering, its preparation, feeding and burning; application of powdered coal to the cement industry, to reverberatory and metallurgical furnaces, and its use in locomotives. The concluding chapter deals with means of preventing so-called explosions that may accompany the use of powdered coal.

"Federal Safety Standards for Toilet, Wash and Locker Rooms," is discussed in the September bulletin Safety issued by the American Museum of Safety, 14-18 West Twenty-fourth Street, New York. Sections are included covering the design and construction of the rooms and buildings; interior finish of buildings; heating, lighting and ventilating; location of rest rooms, toilet, wash and locker rooms, with detailed specifications of their necessary equipment.

"Enamels" is the title of a book published for the benefit of the enameling industry by the Harshaw Fuller & Goodwin Co., Cleveland, Ohio. The booklet is a collection of the various articles on enamel published by Robert D. Landrum in various technical journals. Chapters on the subject of enamels for sheet steel include information regarding the function of the various raw materials, resistance of enamels to solution by acetic acids of various strengths, a comparison of ten white enamels, the necessity of cobalt in ground coat enamels, methods of analysis for enamel and enamel raw materials, atomic and molecular weights and factors used in ceramic calculations, and cubical coefficients of expansion.

"Safe Clothing for Men and Women in Industry" is the subject of issue No. 16 of Safe Practices, published by the National Safety Council, 208 South La Salle Street, Chicago. Section headings indicative of the scope of the bulletin include working garments, aprons, caps, shoes, leggings, arm protectors, gloves, goggles, breathing apparatus, safety suggestions and receipes for fire-proofing clothing, caps, gloves, leggings, etc. Illustrations of desirable clothing and protective apparatus are included. Copies are obtainable from the Council at 10 cents apiece.

New Iron and Steel Industry at Bergen, Norway

U. S. Commercial Attaché Erwin W. Thompson reports that a new company has been formed in Bergen, Norway, called Staal & Jernindustri A. S. (Steel & Iron Industry, Ltd.). This enterprise will be especially useful for furnishing the iron which will be used so much for re-erecting the office buildings destroyed by the great fire. The new buildings will be mainly of iron, glass and concrete.

To commemorate the completion of the first 500 3-in. high-angle guns, the employees of this department of the Poole Engineering & Machine Co., Woodberry, Md., held a banquet at the Southern Hotel, Baltimore, Nov. 2. Many of the officials of the company attended. The order for the guns was filled fourteen months after it was received.

ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY WILLIAM W. MACON GEORGE SMART

CHARLES S. BAUR, *Advertising Manager*

Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *President and Treasurer* Fritz J. Frank, *Vice-President* George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Peace Problems Now

The war is won, whatever number of weeks or months may be required for the making of final peace terms. The crowding of determining events into the first week in November has been fairly bewildering. The end comes in sight just as the United States Government through its various war agencies is pressing upon industry more urgently than ever the subordination of every use of the materials required by war to the single purpose to which the country has given itself without reserve. It was only to be expected that the American people would be at the height of their effort, whenever the war ended. Should it go on another year that would still be the fact.

But the culmination has come so suddenly that only in a confused way can the mind take in the fact that the remaking of the world is in actual process. At home it is already plain that great as were the tasks imposed by the country's going into the war, the domestic problems that must now be dealt with are even greater. Unity in the face of a dangerous foe was imperative; so unity came, and differences were dropped. The days of reconstruction will bring division of counsel and of interest, and the developments of the past two weeks have shown plainly that political and partisan differences will be large factors from this time on.

In the settling of the vexed questions involved in the large control the Government now has of industry, it is to be determined in the days that are ahead whether the people's representatives bear to them the relation of servant or master, and the business men of the nation should have no small part in deciding what the answer is to be.

Expansion of Forging Facilities

One of the chief problems which confronted the Ordnance Departments of the Army and Navy when the United States entered the war was the creation of much larger facilities for the forging of shell steel and guns. Practically all existing forge plants were enlarged, and many new plants were created. While a few of those which were financed exclusively by the Government will probably continue after the war in the work of furnishing guns for the Navy and for coast defense, the majority of them will be converted to commercial work. The forging facilities of the country have been greatly multiplied, and as many of the forge shops will be taken over by the companies now operating them it is to be expected that new products of forged steel will be placed upon the market, in some instances taking the place of iron and steel castings. The forged steel wheel for railroads has been gaining ground, and a greater development of this product may be looked for. One company which is now making gun forgings and rough machining them will immediately turn to the manufacture of locomotive tires when its Government contract is canceled.

The Future of Steel Prices

There is a very wide range of opinion as to how steel prices will trend upon the cessation of hostilities. Some views are expressed that the trend will be upward, so that if the market is to be held steady a continuation of the present maximum limits will be necessary. Others hold that a depression impends, so that if the market is to be stabilized it will be necessary to establish minimum, instead of maximum, limits.

Two periods are of course clearly in sight, a period, relatively short, of readjustment, or establishment of a trading basis, and then a period, relatively long, of industrial activity in which the world will be reconstructed. Some observers go farther and predict a long period of depression, still later, in which "the world will pay for the war." When the two earlier periods are of such vital and pressing importance, consideration of this possible third period may be postponed, except it may be suggested that if there is anything in the theory the phraseology is poor. Men do not "pay" by being idle. They suffer punishment, and if there is cause for punishment the cause will probably be excesses committed in the intervening period of activity.

While the period of readjustment and the period of activity are distinct, the first hinges upon the second. When the nature and circumstances of the second period become understood and appraised the fact will in itself cause the first period to end. The first period is one of

seeking for a basis or level, and when the thing is found the search ends.

The first requisite in a study of the prospects is a correct conception of historic price relations. In many quarters that does not exist to-day. Mental habits vary. One man compares an existing price with a historic low price as his standard. Another compares with a historic high price. Few men deal in averages. Inasmuch as the consumption of steel is largely for construction purposes it is not ability to pay but willingness to pay that determines steel demand. It is largely a matter of the investor's appraisal of the earning prospects of the investment. It is possible to secure a million dollars for one project while for another a thousand cannot be secured.

The period of industrial activity, for which the period of readjustment must find a proper basis, will be largely one of investment in which steel will be bought and put to work earning money. The position of the investor, therefore, must be considered. The investor does not buy steel at low prices, for the statistics of production show that it is when prices are lowest that the least steel is produced. The buying of steel is chiefly at intermediate and even relatively high prices. Averages therefore are to be considered. The present set maximum prices are a trifle more than double the average of quoted market prices in the ten years 1904 to 1913, the increase being in the neighborhood of 110 per cent. The increase in plates is a trifle more than 110 per cent., while structural shapes are up about 100 per cent. It is true that steel is not bought at maximum prices, on a bulge, in proportion to the length of time during which those prices represent the market; but on the other hand production is light when prices are low, and thus in a period of years the average price paid on the entire tonnage is probably not far from the average of quoted prices, giving each week the same weight in ascertaining the average.

The relation of existing prices to former average prices is much more important than their relation either to historic low prices or to the absurd prices that were quoted as the market for a few months prior to the advent of the present Government control. One recognizes at once that there is no very great distortion in the relation between existing prices and present cost of production. Freight rates will hardly be reduced. The steel industry is not in the habit of reducing wages, and a large influx of labor is hardly to be expected. Immigration in volume does not seem to be indicated, while the returning soldier is hardly likely to gravitate to a blast furnace or steel works job. The eight-hour shift is expected to follow eventually the recent establishment of the eight-hour basis of wage payment. While that change would save the cost of overtime it would increase the number of men required and tend to sustain the hourly wage rate.

The existing steel prices are not on the whole out of line with the purchasing power of the dollar in general Besides the cost of construction of things requiring steel, the investor will have to consider many other matters. The cost of operation has increased and prospective returns have also increased. All the items in the investor's problem are new and the cost of steel is only one of them.

On the score of supply and demand after the war, the position of steel differs from that of most commodities because of the great extent of its present absorption in war and essential needs. Whether the replacement of war consumption by peace consumption will be of large volume early in the peace regime is a question on which the entire industry is seeking light, and with it is involved the question of Government control on which comment is made below.

After-War Control of Industry

To many it may seem an easy matter for the War Industries Board to continue functioning after the cessation of hostilities, for the purpose of replacing industries upon a peace basis; but the difficulties are far from negligible. As to the existence of the War Industries Board and other Governmental agencies for the prosecution of the war there is no complication, since activities created "for the period of the war" do not terminate until the President issues his peace proclamation, and some are definitely constituted to run for limited periods thereafter. The terms of an armistice may make the resumption of hostilities practically impossible, but legally the war lasts until peace is formally proclaimed, and there may therefore be months of commercial readjustments before the legal advent of peace.

The difficulty lies with the powers of the War Industries Board. Some of the powers exercised have rested upon full legal foundation, others have rested simply upon the co-operative spirit of commercial interests, which recognized a plain public duty, and made many sacrifices in order to perform that duty. The process of reconstruction aimed at is one that will benefit industry, and co-operation in that connection might be questioned on legal grounds. It is intimated that legislation will be sought, but such legislation may be difficult to formulate and still more difficult to carry through promptly.

The objective hitherto has been a plain and simple one; the objective in the reconstruction period involves a complication of purposes. Thus far there has been but one position: "Winning the war is everything; nothing else counts." To put industry on a safe and remunerative basis for future years may seem a simple proposition, but the various interests involved, related to each other in complicated manner, have to be considered, for the eventual restoration of individual initiative and control is of course essential. Hitherto the stimulation of high-cost production has been warranted, for the war might be won by the last ton of steel or the last ship. It has been necessary to keep labor satisfied, even to pamper labor and to wink at or even support injustices. In reconstruction these are among the things that are precisely to be avoided. Large profits on the one hand and heavy taxation on the other have alternately been used to excuse each other, but no such theories are reasonable in peace times. Taxation will have to be much more scientific,

while on the other hand exceptional profits will hardly be regarded as being for the common good.

It is the essence of war to be extremely wasteful of materials, when waste is thought of in ordinary terms, for the military value of material is subject to wide and almost instantaneous fluctuations. A hundred shells at a given time and place may be more valuable than a hundred thousand at another time and place. The change from war time to peace time conditions cannot be effected without something akin to waste, viewed in the abstract. The marshaling of industry for winning the war has been a gradual process, production increasing continuously to a peak. Reconstruction cannot proceed in the same way, from little beginnings to larger and larger things. The whole war machine in all its accumulated bigness is the present fact and must be dealt with accordingly. In a sense, the maximum transformation effort must come at the start, gradually tapering off as less and less remains to be done. Thus in a way reconstruction is a much greater task than was the building of the industrial war machine.

One vital fact in this problem is that the intimate knowledge of industries acquired by the War Industries Board and the close relations that have been built up between the board and industries constitutes a very valuable asset, and one therefore that must be used for the common good. The statement of the problem is simple. The solution will prove both intricate and interesting.

Bar Iron Base Prices Amended

In the forthcoming price book of the American Iron and Steel Institute a change will be made in the schedule of prices on bar iron announced by the Committee on Steel and Steel Products on Oct. 17. On common merchant iron the base price remains at 3.50c. On refined iron made from puddle iron and selected scrap an extra of 1.50c. per lb. is provided for, making the price 5c. A new intermediate price of 4.25c. (representing an extra of 0.75c. on the 3.50c. base) is provided for refined iron made from all selected scrap. This change is made principally to meet the situation in the Western and Central Western bar iron trade, which was somewhat confused over the original announcement providing simply a 3.50c. base price for common iron and a 5c. base price for refined iron. The extras for sizes, quantities, etc., as provided in the amended bar iron schedule, are as follows:

Rounds and squares ½ in. and smaller and all rounds and squares over 1⅞ in. may be graded as refined iron.

Light bands, as per National list, may be graded as refined iron.

Sizes above base sizes, in flats, may be graded as refined iron.

Flats from 1 in. to 4 in. wide, by ¼ in. to 1 in. thick, inclusive, are furnished in common merchant iron; smaller flats may be graded as refined iron.

Hexagons, ovals, half ovals, half rounds, and fender, round edge and round edge tire irons may be graded as refined iron.

Common merchant iron is defined in the amended bar iron paragraphs as "material made entirely from common scrap." Refined iron is defined as "material made entirely from selected wrought scrap or made from puddled bar and selected wrought scrap." The prices given above do not apply to specification or test irons, which are subject to negotiation.

The Canadian War Trade Board has passed an order widening the control of the Government over the steel consumption of the Dominion. The order prohibits the use of structural steel, sheets, shapes, plates, bars, etc., the value of which exceeds $2000, without a license.

TO HELP IN WAR WORK

New Scrap Section Is Created—Pig Iron and Coke Experts Enlisted

The War Industries Board at Washington is continuing to strengthen its organization and has established an iron and steel scrap section with W. Vernon Phillips as its chief under J. Leonard Replogle, Director of Steel Supply. Mr. Phillips will have offices at both Washington and Philadelphia and has appointed as his assistant Richard Peters, Jr., of Rogers, Brown & Co., Philadelphia. Mr. Peters has had experience of a number of years as a salesman of pig iron and coke and has a general knowledge of the iron trade which will be valuable in his new work. Co-ordinating members of the section will be: For the railroads, George G. Yeomans, at present a member of the Central Advisory Purchasing Committee, United States Railroad Administration; for the Army, Major W. W. MacCleary; for the Navy, Lieutenant Commander S. R. Fuller; for the Emergency Fleet Corporation, H. F. Grimes.

Another addition to the forces of the War Industries Board is B. S. Stephenson, who for a number of years has been resident agent at Pittsburgh of M. A. Hanna & Co., Cleveland, and will assist the Board in the distribution of pig iron.

The immediate purposes of the new iron and steel scrap section will be the co-ordination of the iron and steel scrap requirements and supplies of the War Department, the Navy, the Railroad Administration and the Emergency Fleet Corporation; the distribution and supply of all other available iron and steel scrap to the steel and iron makers, and the practical reclamation of iron and steel scrap not now available.

The Sub-Committee on Scrap Iron and Steel of the American Iron and Steel Institute is continuing its functions in the practical carrying out of the plans of the War Industries Board with the added authority given to it through the chief of the Iron and Steel Scrap Section. Its personnel remains the same and no changes are at present contemplated in its method of operation except by an enlargement of the force working under the chairman and secretary at Philadelphia, and the establishment of a regional organization which will cover the entire country, not only for the purpose of practical reclamation, but to intensify and encourage the operation of scrap yards and the rapid movement of material from the industrial plants, public utilities, etc., to the consumer or scrap yard, and otherwise act for the general good under existing circumstances as far as iron and steel scrap is concerned. A leading dealer estimates that about 33 per cent of all ship steel, shells and munitions is made from steel scrap.

Mr. Phillips will be glad to hear from men who are in a position to unselfishly volunteer their time and services, having a knowledge of iron and steel or iron and steel scrap, addressing the Pennsylvania Building, Philadelphia.

New Charcoal Iron Furnace

The Mid-Continent Iron Co., Kansas City, Mo., has under construction and nearing completion at Midco, Mo., a charcoal iron blast furnace of 100 tons capacity, the plant including equipment for the recovery of alcohol and acetate of lime. The capacity of the charcoal retorts will be 200 cords per day. It is expected that operations will begin about Nov. 15.

The Dominion Government has agreed to give British Columbia shipbuilders higher prices for the construction of vessels than are paid in the East or in the Pacific Northwest. The exact figures are not stated. Contracts for ten steel vessels for the Government were recently awarded, eight to Vancouver and two to Victoria yards.

The Western Iron Works, Spokane, Wash., manufacturer of gasoline mine locomotives, is also turning out a four-wheel drive motor truck. It has a load capacity of two tons. An order for 60 of these trucks was booked as soon as the first public demonstration was given.

New National Labor Bureau

WASHINGTON, Nov. 5.—The Department of Labor has created a new bureau—the Working Conditions Service, which is to work out a program of uniform standards for working conditions in all industries.

For administrative purposes there are to be three divisions in the bureau—division of industrial hygiene and medicine, division of labor administration and division of safety engineering. Since there are in operation other agencies with the specialized function of dealing with wages and hours as controversial questions between employers and employed, they will not be dealt with as such by this service.

The Secretary of Labor, at the request of the Working Conditions Service, requested the Secretary of the Treasury to authorize the United States Public Health Service to detail personnel to the division of industrial hygiene and medicine. As a result of the agreement reached, Dr. A. J. Lanza, passed assistant surgeon of the Public Health Service, was detailed to act as the chief of the division. Dr. C. D. Selby, Toledo, Ohio, will be at the head of the section of industrial medicine.

The division of industrial hygiene and medicine will direct the formulation of sanitary and health codes for industries. Co-operation with the United States Public Health Service will make possible extensive research work necessary to establish fundamental scientific principles as the basis for proper working conditions.

In addition to the work which the United States Public Health Service will perform for the Working Conditions Service, it is also authorized to do all inspections and investigations into matters pertaining to the sanitation of plants engaged on war work and into the health of workers in such industries and into the sanitation and housing conditions surrounding the homes of war workers. In addition, the Ordnance Department of the War Department has delegated responsibility for mechanical safety in ordnance plants.

A field force of specialists in industrial hygiene, sanitation, safety and production engineering, technically trained and of broad practical experience, has been organized which will be under the supervision of Bernard J. Newman.

The division of labor administration will deal with the attitude and policies of the management toward the employed and the personal relations between employer and employed. The chief of this section will be Dr. William M. Leiserson, Toledo, Ohio.

The division of safety engineering completes the Working Conditions Service. Standards for mechanical safety have been more adequately worked out than standards for sanitation and industrial hygiene, says a statement of the Department of Labor. There are now in nearly all States safety codes and agencies charged with the establishment and maintenance of industrial safety. Supplementing Government agencies, the great energizing forces in this field have been the National Safety Council and various technical societies. The policy of the Working Conditions Service is to avoid duplication of work and activity and, by acting as a co-ordinating agency, co-operate with the forces already in the field to bring federal directing impetus in the campaign for uniformity of safety standards, practices and equipment standardization of safety organization, and for the collection of data necessary for the continuous modification of standards to meet new conditions.

The Bureau of Standards has offered its co-operation in the formulation of codes. The National Safety Council has agreed to co-operate with the working conditions service and appointed a committee of five for consultation and advice. The codes which are to be worked out under the division of safety engineering will be the result of experience and experimentation, consultation with technical organizations and conferences with employers and employees in order to ascertain the necessary practical modifications.

The director of the Working Conditions Service is Grant Hamilton and the assistant director is Florence C. Thorne.

Women serving as drivers and aids in the American Red Cross Motor Corps Service exceed 6000.

CONTENTS

Highest Puddling Rate Ever Recorded

The bi-monthly wage-scale examination of the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers, at Youngstown, Ohio, last week, developed that the average selling price of bar iron for September and October was 3.45c., which means an advance of one point in the wage scale, and makes the price of puddling $16.80 per ton, which is the highest ever reached.

Elements of the Labor Problem

The Boston Section of the American Society of Mechanical Engineers met on Oct. 29. Invitations had been extended to all Boston engineering and employers' societies and to the engineers of Providence and Worcester. Wm. G. Starkweather, chairman, Boston Section, presided. In the absence of M. W. Alexander, managing director National Industrial Conference Board, who was by reason of illness prevented from attendance, an address of impromptu but very instructive character on "Elements of the Labor Problem," was given by Frederick P. Fish, also of the National Industrial Conference Board. He was followed by W. E. Freeland, assistant to the managing director, Winchester Repeating Arms Co., New Haven, Conn., and Gardner Perry, examiner Shipbuilding Labor Adjustment Board, also district representative Emergency Fleet Corporation, North Atlantic district.

The first marine turbine has been completed by the Hallidie Machinery Co., Spokane, Wash., on a contract for ten of the machines ordered by the Emergency Fleet Corporation. The turbines will be placed in ships now being built at Seattle. Each turbine represents about $80,000. The plant is running three shifts per day and its enlargement is contemplated.

PIG IRON OUTPUT LESS

October Total, 3,486,941 Gross Tons

Exceeded Only in September, 1918, and October, 1916

The output of pig iron in October was expected to show a new record, but the inroad of the influenza upon working forces in several districts was enough to bring the total below that of September. At 3,486,941 tons for 31 days the daily average was 112,482 tons against 3,418,270 tons for the 30 days of September, a daily average of 113,942 tons.

Twelve furnaces blew in and 12 blew out last month, leaving the total unchanged at 365. Capacity active Nov. 1 was 113,500 tons, against 114,570 tons on Oct. 1.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in August and the three months preceding:

Monthly Pig-Iron Production—Gross Tons

	July (31 days)	Aug. (31 days)	Sept. (30 days)	Oct. (31 days)
New York	229,424	219,040	222,506	231,286
New Jersey	20,588	17,049	19,017	14,466
Lehigh Valley	112,305	114,397	133,550	128,897
Schuylkill Valley	98,197	91,296	85,873	75,959
Lower Susquehanna and Lebanon Valleys	84,489	87,118	92,582	94,350
Pittsburgh district	707,023	687,433	699,802	702,690
Shenango Valley	161,548	177,204	174,063	181,094
Western Pennsylvania	200,511	182,315	185,508	184,888
Maryland, Virginia and Kentucky	98,334	90,423	99,035	91,899
Wheeling district	138,736	140,154	136,216	142,059
Mahoning Valley	293,627	292,759	310,404	337,165
Central and Northern Ohio	283,402	301,665	292,521	295,469
Southern Ohio	64,242	69,633	68,153	75,661
Chicago district	577,230	556,985	529,824	560,839
Mich., Minn., Mo., Wis., Col. and Wash.	113,487	112,473	124,659	128,091
Alabama	201,867	221,997	215,882	215,631
Tennessee and Ga.	30,878	27,644	28,675	26,557
Total	3,420,988	3,389,585	3,418,270	3,486,941

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from October, 1917, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
October, 1917	76,664	29,886	106,550
November	77,135	29,724	106,859
December	66,605	26,392	92,997
January, 1918	55,662	22,137	77,799
February	56,938	25,897	82,835
March	74,526	29,122	103,648
April	79,199	30,408	109,607
May	81,238	29,937	111,175
June	81,734	29,059	110,793
July	79,248	31,106	110,354
August	80,947	28,394	109,341
September	83,579	30,363	113,942
October	83,686	28,796	112,482

The furnaces blown in include Oxford in New Jersey, Carbon and Saucon in the Lehigh Valley, Delaware River in the Schuylkill Valley, "A" stack of the Bethlehem Steel Co. in the Lebanon Valley, Emporium in Western Pennsylvania, one Central and one National Tube in northern Ohio, Bessie in the Hocking Valley, one South Chicago on basic, and Irondale in Washington.

Among the furnaces blown out were one Lackawanna in the Buffalo district, Keystone in the Lehigh Valley, one Steelton in the Lower Susquehanna Valley, Lebanon Valley and "E" stack of the Bethlehem Steel Co. in the Lebanon Valley, one Lucy and one Eliza in the Pittsburgh district, Marshall in Western Pennsylvania, one Maryland Steel Co. in Maryland, one River in Ohio, Lawrence and Hamilton in Southern Ohio.

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steelmaking iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total production			Spiegeleisen and ferromanganese		
	1916	1917	1918	1916	1917	1918
Jan.	2,251,035	2,244,203	1,756,208	24,866	38,792	30,525
Feb.	2,183,845	1,829,846	1,620,254	23,877	32,137	28,114
Mar.	2,365,116	2,285,430	2,349,419	29,388	36,563	39,122
Apr.	2,316,768	2,370,937	2,411,488	31,862	39,595	39,511
May	2,408,890	2,404,380	2,513,577	39,844	37,101	[illegible]
June	2,295,784	2,304,155	2,407,166	38,597	30,829	43,844
July	2,306,303	2,369,630	2,456,693	31,353	43,884	44,162
Aug.	2,313,122	2,214,513	2,509,357	33,338	39,492	44,009
Sept.	2,309,710	2,198,705	2,507,381	29,491	42,256	40,275
Oct.	2,530,806	2,376,589	2,594,277	34,566	48,691	70,379
Nov.	2,404,210	2,349,545	.....	44,975	34,688	.....
Dec.	2,294,620	2,094,659	.....	43,470	29,902	.....

Capacity in Blast October 1

The following table shows the number of furnaces in blast Nov. 1 in the different districts, also the number and daily capacity in gross tons of furnaces in blast Oct. 1.

Coke and Anthracite Furnaces in Blast

Location of furnaces	Number of stacks	Nov. 1 Number in blast	Nov. 1 Capacity per day	Oct. 1 Number in blast	Oct. 1 Total Capacity per day
New York:					
Buffalo	21	21	6,910	21	6,722
Ferro	1	0	0	1	89
Other N. Y.	3	3	575	3	612
Ferro	1	1	90	1	140
New Jersey	4	4	550	3	567
Ferro	1	1	45	1	45
Pennsylvania:					
Lehigh Valley	18	16	4,000	15	4,267
Spiegel	2	2	200	2	185
Schuylkill Val.	13	10	2,685	9	2,713
Spiegel	2	1	80	1	107
Lower Susquehanna	8	6	1,800	7	1,833
Ferro and spiegel	2	2	95	2	96
Lebanon Val.	6	6	1,110	5	819
Ferro and spiegel	4	2	150	4	288
Pitts. district	52	49	21,950	50	22,486
Ferro and spiegel	5	4	800	5	841
Shenango Val.	19	19	5,845	19	5,805
Western Pa.	25	20	6,040	21	6,324
Ferro and spiegel	3	3	175	2	95
Maryland	4	3	780	4	1,217
Wheeling dist.	14	14	4,580	14	4,542
Ohio:					
Mahoning Val.	27	26	10,875	26	10,615
Central and Northern	26	25	10,000	24	9,624
Southern	17	14	2,100	15	2,294
Ill. and Ind.	40	38	18,100	37	17,837
Ferro	1	1	70	1	95
Mich., Wis. and Minn.	13	10	2,700	10	2,697
Col., Mo. and Wash.	7	5	1,370	4	1,345
Ferro	1	1	110	1	115
The South:					
Virginia	15	9	1,100	9	1,137
Ferro and spiegel	4	4	135	4	163
Kentucky	7	4	670	4	696
Alabama	45	30	6,920	29	7,025
Ferro	1	1	30	1	32
Tenn. and Ga.	16	10	860	10	956
Total	428	365	113,500	365	114,570

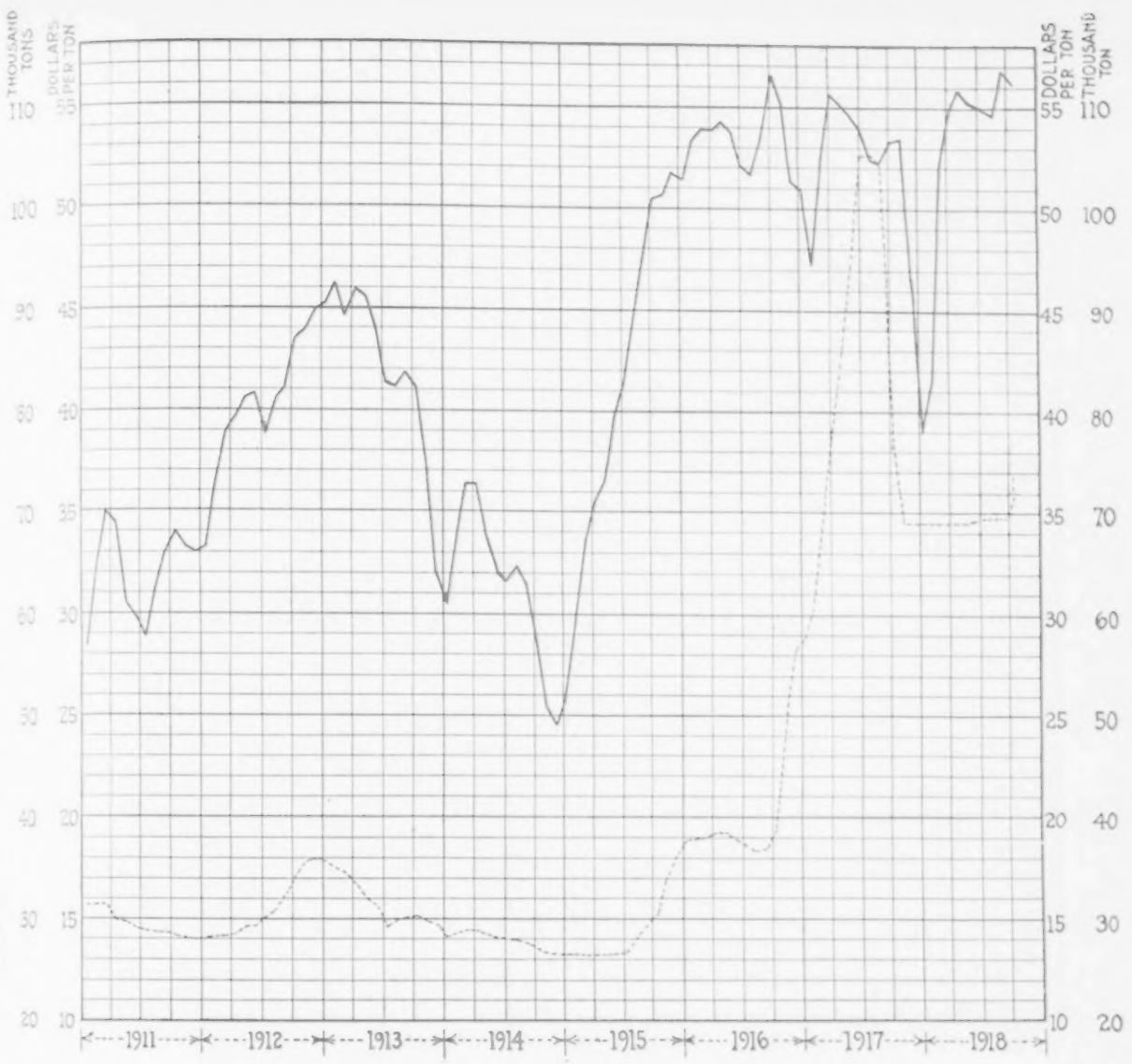
Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace at Chicago, and No. 2X at Philadelphia. They are based on the weekly market quotation of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1914—Gross Tons

	1914	1915	1916	1917	1918
Jan.	1,885,054	1,601,421	3,185,121	3,150,938	2,411,768
Feb.	1,888,670	1,674,771	3,087,212	2,645,247	2,319,299
Mar.	2,347,867	2,063,834	3,337,691	3,251,352	3,213,091
Apr.	2,269,655	2,116,494	3,227,768	3,334,960	3,288,211
May	2,092,686	2,263,470	3,361,073	3,417,340	3,446,412
June	1,917,783	2,380,827	3,211,588	3,270,055	3,323,791
July	1,957,645	2,563,420	3,224,513	3,342,438	3,420,988
Aug.	1,995,261	2,779,647	3,203,713	3,247,947	3,389,585
Sept.	1,882,577	2,852,561	3,202,366	3,133,954	3,418,270
Oct.	1,778,186	3,125,491	3,508,849	3,303,038	3,486,941
10 mos.	20,015,384	23,421,936	32,549,894	32,097,269	31,718,356
Nov.	1,518,316	3,037,308	3,311,811	3,205,794	.....
Dec.	1,515,752	3,203,322	3,178,651	2,882,918	.....
Total yr*	23,049,752	29,662,566	39,039,356	38,185,981	.....

*These totals do not include charcoal pig iron. The 1917 production of this iron was 376,525 tons.



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

The figures for daily average production, beginning with January, 1911, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1911—Gross Tons

	1911	1912	1913	1914	1915	1916	1917	1918
Jan.	58,752	66,384	90,172	60,808	51,659	102,746	101,643	77,799
Feb.	64,690	72,442	92,369	67,453	59,813	106,456	94,473	82,835
Mar.	70,036	77,591	89,147	75,738	66,575	107,667	104,882	103,648
Apr.	68,836	79,181	91,759	75,665	70,550	107,592	111,165	109,607
May	61,079	81,051	91,039	67,506	73,015	108,422	110,238	111,175
June	59,585	81,358	87,619	63,916	79,361	107,053	109,002	110,793
July	57,841	77,738	82,601	63,150	82,691	104,017	107,820	110,354
Aug.	62,150	81,046	82,057	64,363	89,666	103,346	104,772	109,341
Sept.	66,903	82,128	83,531	62,753	95,085	106,745	104,465	113,942
Oct.	67,311	86,722	82,133	57,361	100,523	113,189	106,350	112,482
Nov.	66,648	87,697	74,453	50,611	101,244	110,394	106,859	.....
Dec.	65,912	89,766	63,987	48,896	103,333	102,537	92,997	.....

Blast Furnace Coke Stocks

WASHINGTON, Nov. 5.—Reports to the United States Fuel Administration for the week ending Oct. 26 revealed less than a week's supply of coke for the 411 blast furnaces of the country. Much concerned over these conditions, the Fuel Administration has sent a representative into the Pennsylvania and Southern fields, in an effort to expedite the coke output. The normal weekly requirement of these furnaces, says the report, is 878,325 tons, but only 732,012 tons was reported available.

The lowest figures came from the Pittsburgh district, where 33 furnaces reported only 46,890 tons against a weekly requirement of 138,061 tons. In the section east of Pittsburgh, favored because of the necessity of guarding against transportation difficulties, the supply was 222,998 tons against the weekly need of 128,874 tons. This is short of the two weeks' ration which the administration regards as a minimum of safety. The report contains the following data for other districts, with the number of stacks and the normal weekly consumption:

Youngstown and New Castle, 52 stacks; normal weekly consumption, 152,549 tons; coke on hand, 104,709 tons.

Buffalo, 23; 63,134 tons; 80,599 tons.

Cleveland, Lorain, Toledo, etc., 22 stacks; 47,917 tons; 45,890 tons.

Indiana, Illinois, Wisconsin and Minnesota, 48 stacks; 136,059 tons; 119,288 tons.

Columbus and Zanesville, 6 stacks; 10,669 tons; 5,424 tons.

Ironton, 18 stacks; 19,451 tons; 11,208 tons.

Virginia, 19 stacks; 18,255 tons; 24,279 tons.

Tennessee, 15 stacks; 10,174 tons; 10,077 tons.

Alabama and Georgia, 43 stacks; 75,978 tons; 47,161 tons.

The West, 8 stacks; 14,526 tons; 2,790 tons.

The coke report of the Geological Survey shows a production of 592,000 tons of beehive coke in the week ending Oct. 26, against 572,000 in the week ending Oct. 19, and an output of 577,808 tons of by-product coke against 578,027 tons in the preceding week. The completion of the new ovens of the Carnegie Steel Co. at Clairton, Pa., has added 1300 tons to the weekly capacity of the Pennsylvania by-product plants.

The influenza epidemic continues to result in serious reductions of the bituminous coal output. For the week ending Oct. 6 the production fell to 11,213,000 tons, against 11,324,000 tons in the preceding week.

Iron and Steel Markets

SOME CANCELLATIONS

Barbed Wire and Other Requirements Will Be Less

Ordnance Program Shortened—Pig Iron Production Fell Off in October

How fast and how far the war demand for iron and steel will now fall off is the uppermost question in the industry. The shortening of the program of shipyard extensions was the main feature last week. Of greater significance are the moves made this week in the reduction of munitions and ordnance orders, now that peace is more plainly in sight.

While the project for the Neville Island gun plant has not been abandoned, as report had it, a revision of the plans is under way, reducing considerably the scale of operations. It is quite certain also that work will not go forward on the 12-inch howitzer shop which was to have been built at the Midvale works at Nicetown.

In barbed wire a virtual cancellation of 22,000 tons for Great Britain and 65,000 tons for Italy is reported. France was to receive 50,000 tons in the first half of 1919, and both this and a 30,000-ton contract for wire rods for France have now been held up.

Steel works and rolling mills may be nearer the end of their work on shell steel than is commonly thought, even though the war go on for some months. In the past 11 months close to 5,100,000 tons of shell steel orders have been distributed for rolling. Probably 2,500,000 to 3,000,000 tons of this is today between the rolling mills and the ships that are to carry it to Europe—at forges, finishing shops, shell loading plants or en route. It is expected that rail mills that have been rolling large rounds for shells can soon turn to rails, for rails are needed.

Considerable shell steel is still on the books for the Allies and the first cancellations are likely to come on these contracts rather than those of the United States Government.

So far as concerns work immediately in hand, however, Government agencies are urgently calling for deliveries, and those in charge of steel production and distribution are seeking in every way to reduce the effect of fuel shortage due to influenza in the Connellsville coke region.

There is unofficial advice of plans for the continuance of the price-fixing committee of the War Industries Board for six months after peace is declared. This is presumably in answer to inquiries that have been going to Washington from the steel trade concerning the future of Government control.

Influenza defeated the well-laid plans for new records in October at blast furnaces and steel plants. Pig iron output was 3,486,941 tons, or 112,482 tons a day, as compared with 3,418,270 tons for the 30 days of September, or 113,942 tons a day. However, last month's record was only exceeded once previous to September, the month of October, 1916, showing 113,189 tons a day.

Twelve furnaces were blown in and 12 were blown out in October, so that 365 furnaces were active on Nov. 1 as on Oct. 1.

Hesitation is evident among buyers of pig iron and finished steel, awaiting the development of the Government's policy as to cancellations. On the belief that considerable American and Allied forces will be required to police Europe for many months, only a gradual reduction in war buying is looked for.

The wire trade may be the first to develop peace activity. After some months of the withdrawal of its salesmen from the field the leading wire interest has now sent out a considerable number.

Some signs of weakness are cropping up in old material, which is ordinarily most sensitive to market influences. Mills are holding back, counting on some recession. Prices on some forms of scrap have already yielded in the Chicago district.

The bar iron price schedule has been changed, chiefly to meet the situation in the Central West, where some users turn to steel when iron is too high priced. There is now an intermediate price of 4.25c. for refined iron made from all selected scrap, common iron remaining at 3.50c. and refined iron at 5c.

For some time it has been planned to turn several furnaces from ferromanganese to pig iron, in view of the accumulation of the former and the great scarcity of the latter. Two Virginia furnaces and one in the Pittsburgh district are about to make this change. At 70,379 tons, production of ferromanganese and spiegeleisen made a new high record in October.

Pittsburgh

PITTSBURGH, Nov. 5—(*By Wire*).

Unofficial advices have been received here from Washington that the Government bodies created for the duration of the war, including the Price Fixing Committee of the War Industries Board, will be authorized to continue for six months after peace is declared, and it is presumed that this will mean Government control of prices for that period. The question of whether the Government would continue its policy of controlling prices over the readjustment period has been the one thing that has given the iron and steel trade serious concern. It is recognized that immediately following the conclusion of peace there must be a period in which business will hesitate, and much harm might come to the entire industry if there were any sudden and drastic drop in prices. While admitting that iron and steel prices may come down, producers prefer that such readjustment should be gradual, so as to work as little disturbance as may be possible in the general business situation. Extreme confidence in the ultimate outcome of after-the-war business pervades the entire industry. Here and there is found a note of pessimism, but the general tone is decidedly optimistic, and it is believed that the readjustment during the transitation from a war to a peace basis will be made with comparative ease, and will be followed by a demand for steel products unprecedented in history, excepting, of course, the peak loads carried during recent months of greatest war activity.

As soon as there is any letup in Government demand,

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Nov. 6, 1918	Oct. 29, 1918	Oct. 8, 1918	Nov. 7, 1917
No. 2 Philadelphia	**$39.15**	$38.85	$38.85	$34.25
No. 2 Valley furnace	34.00	34.00	34.00	33.00
No. 2 Southern, Cin'ti	37.60	37.60	37.60	35.90
No. 2 Birmingham, Ala.	34.00	34.00	34.00	33.00
No. 2 furnace, Chicago*	34.00	34.00	34.00	33.00
No. 2 north eastern Pa.	**36.90**	36.60	36.60	33.75
No. 2 Valley furnace	33.00	33.00	33.00	33.00
No. 2 Pittsburgh	36.60	36.60	36.60	37.25
Malleable Bess., Ch'go*	34.50	34.50	34.50	33.50
Malleable, Valley	34.50	34.50	34.50	33.50
Gray forge, Pittsburgh	34.40	34.40	34.40	32.75
L. S. charcoal, Chicago	38.85	38.85	38.85	37.50
Billets, etc. Per Gross Ton:				
Bess. rails, heavy, at mill	55.00	55.00	55.00	....
Oh. rails, heavy, at mill	57.00	57.00	57.00	....
Bess. billets, Pittsburgh	47.50	47.50	47.50	47.50
Oh. billets, Pittsburgh	47.50	47.50	47.50	47.50
Oh. sheet bars, P'gh.	51.00	51.00	51.00	51.00
Forging billets, base, P'gh.	60.00	60.00	60.00	....
Oh. billets, Phila.	**51.50**	51.30	51.30	....
Wire rods, Pittsburgh	57.00	57.00	57.00	57.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Common iron bars, Phila.	**3.745**	3.73	3.73	4.685
Common iron bars, P'gh.	3.50	3.50	3.50	....
Common iron bars, Ch'go	3.50	3.50	3.50	4.50
Step bars, Pittsburgh	2.90	2.90	2.90	2.90
Steel bars, New York	**3.17**	3.145	3.145	3.095
Tank plates, Pittsburgh	3.25	3.25	3.25	3.25
Tank plates, New York	**3.52**	3.495	3.495	....
Beams, etc., Pittsburgh	3.00	3.00	3.00	3.00
Beams, etc., New York	**3.27**	3.245	3.245	3.195
Struc. grooved steel, P'gh.	2.90	2.90	2.90	2.90
Struc. sheared steel, P'gh.	3.25	3.25	3.25	3.25
Steel hoops, Pittsburgh	3.50	3.50	3.50	....

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Nov. 6, 1918 Cents	Oct. 29, 1918 Cents	Oct. 8, 1918 Cents	Nov. 7, 1917 Cents
Sheets, black, No. 28, P'gh.	5.00	5.00	5.00	5.00
Sheets, galv., No. 28, P'gh.	6.25	6.25	6.25	6.25
Wire nails, Pittsburgh	3.50	3.50	3.50	....
Cut nails, Pittsburgh	4.00	4.00	4.00	....
Fence wire, base, P'gh.	3.25	3.25	3.25	....
Barb wire, galv., P'gh.	4.35	4.35	4.35	....
Old Material, Per Gross Ton:				
Carwheels, Chicago	$29.00	$29.00	$29.00	$27.00
Carwheels, Philadelphia	29.00	29.00	29.00	29.00
Heavy steel scrap, P'gh.	29.00	29.00	29.00	30.00
Heavy steel scrap, Phila.	29.00	29.00	29.00	25.00
Heavy steel scrap, Ch'go	29.00	29.00	29.00	28.00
No. 1 cast, Pittsburgh	29.00	29.00	29.00	27.00
No. 1 cast, Philadelphia	29.00	29.00	29.00	28.00
No. 1 cast, Ch'go (net ton)	29.86	30.36	30.36	21.00
No. 1 RR. wrot., Phila.	34.00	34.00	34.00	35.00
No. 1 RR. wrot., Ch'go, net	29.86	30.36	30.36	31.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$6.00	$6.00	$6.00	$6.00
Furnace coke, future	6.00	6.00	6.00	6.00
Foundry coke, prompt	7.00	7.00	7.00	6.00
Foundry coke, future	7.00	7.00	7.00	6.00
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	26.00	26.00	26.00	23.50
Electrolytic copper, N. Y.	26.00	26.00	26.00	23.50
Spelter, St. Louis	8.60	8.60	8.85	7.62½
Spelter, New York	8.95	8.95	9.20	7.87½
Lead, St. Louis	7.75	7.75	7.75	6.12½
Lead, New York	8.05	8.05	8.05	6.25
Tin, New York	75.00	76.00	82.00	68.00
Antimony (Asiatic), N. Y.	10.50	12.75	14.00	14.00
Tin plate, 100-lb. box, P'gh	$7.75	$7.75	$7.75	$7.75

It is apparent that many consumers, the sheet mills, as one example, will be in the market for semi-finished steel. The sheet mills have been operating at scarcely more than 50 per cent of capacity for some time past. They have four or five months non-cancellable orders on their books, at present rate of production, and they have solicited no commercial business for months. Jobbers will require large tonnages of steel for replacement of depleted stocks, though it is admitted that for a few months, at least, they may buy with great caution and on short deliveries. Tonnages of plates and shapes for shipbuilding and car building now on the books it is expected will be filled.

Great Britain has cancelled 22,000 tons of military barbed wire which had been distributed among the mills, and 65,000 tons for Italy will probably also be cancelled, though no definite instructions have been received yet. France was to receive 50,000 tons in the first half of next year, and it is not expected that this will be manufactured in view of the present war situation. Some relief in the wire situation is expected, and in anticipation of this the American Steel & Wire Co. has notified some of its salesmen to report for duty. A conference of district sales managers of this interest will be held in New York on Wednesday to formulate a sales policy. If Germany accepts the armistice terms proposed by the Allies and the United States, it is expected that cancellations of steel and shells for the Allies will be the first to come. The iron and steel trade is waiting for the war to end, and until this event is announced, things will probably move slowly. Opinions as to the course which events will take as affecting the industry are confused and conflicting, a majority freely conceding that predictions are merely guesswork. As an official of a large steel company expressed it, "One man's guess is as good as another's." Factors in the coming readjustment which, however, are being freely discussed are the manner in which cancellation of Allied and United States Government contracts will be put into effect; the possibility of Government control of prices during the readjustment period; the supply of labor and the question as to whether wages will be reduced, and the volume of both domestic and export iron and steel business that will be available to take the place of large war tonnages now on the books. In the absence of any definite information, the after-the-war situation is construed in many different ways, but actual conditions in all probability will be shaped by events within the next few weeks.

Pig Iron.—To-day the pig iron trade was waiting for something to happen. It is fairly certain, however, that should Germany capitulate to the terms of the armistice proposed by the Allies and the United States, pig iron producers and sellers will continue to wait. Most of them are in a fairly comfortable position. They are sold up for the remainder of this year and for first quarter, and in some cases well into the first half of next year. Some sellers have even covered all allocated orders with contracts, and they have no fear of cancellation of these. Sellers who have not thus protected themselves believe that many of the orders which the Government has allocated will be cancelled. One leading seller is not concerned, however, as to the possibility of such cancellations, and in fact would welcome them in order to be able to once more take care of regular customers, whose requirements in normal times always received first consideration. Word from Washington that all Government bodies created for war service will be authorized to continue for six months after the year has been reassuring. This is believed to indicate that the Government will continue its policy of fixed prices and the pig iron trade will thus be stabilized over the readjustment period. No sales are reported, consumers showing little interest at present in future commitments.

Basic pig iron, $33; Bessemer, $35.20; gray forge, $33; No. 2 foundry, $34; No. 3 foundry, $33.50, and malleable $34.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh district being $1.40 per ton.

Billets and Sheet Bars.—A leading interest expects a large demand for rerolling billets and sheet and tin-

plate bars as soon as the Government begins to release steel for non-war purposes. Consumers of billets and sheet bars have been operating at reduced capacity for several months owing to the shortage of steel. A leading sheet interest has made practically no roofing sheets or terne plate for some time, and it expects a good demand for this material and also for corrugated sheets as soon as it becomes possible to fill orders. After Jan. 1 the tin plate industry must go ahead at full capacity again, war or no war, in order to take care of next year's food supply. The present restriction upon tin plate production amounts to 150,000 tons of steel for the last three months of this year. A maker of strip steel has been advised by Washington that it will not allocate billets for this work, and he must depend on regular sources of supply for his steel, although these sources have not been able to furnish billets in the quantities needed.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50, and bars $51, forging ingots $73, and forging billets $60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Structural Material.—Mills and fabricators in the Pittsburgh district have received orders to cancel tonnages of structural steel scheduled for the Alameda, Cal., shipyard of the Bethlehem Shipbuilding Corporation, work on which has been abandoned by the Emergency Fleet Corporation. The structural steel market is very quiet. There has been a let-up even in Government work, due no doubt to the possibility of an early peace. No inquiry has been received as yet from prospective builders in anticipation of peace. A period of hesitancy is naturally looked for, it being considered unlikely that investors will go ahead with building projects until a readjustment has been worked out in the prices for material and labor. Architects are said to have a number of building plans pigeonholed, and some of these may come to light when the opportune moment arrives. The McClintic-Marshall Co. will complete about Jan. 1 two new fabricating shops, one at Leetsdale, Pa., and the other at Pottstown, Pa., each having a capacity of about 10,000 tons of ship steel per month. Although the shipbuilding program will go on at practically full speed in 1919, it is stated that fabricating facilities of the country, which have been enlarged during the war, will be greatly in excess of the requirements of the shipbuilding industry and fabricators are already becoming concerned as to prospects for building work.

We quote beams and channels up to 15 in. at 3 c. at mill, Pittsburgh, for fourth quarter.

Wrought Pipe.—Production of standard pipe in the aggregate continues at a good rate despite the inroads made by influenza. There is an increased production of lapweld pipe to meet the demand for oil country goods. Discounts on iron and steel pipe are given on page 1179.

Boiler Tubes.—There is no change in the situation, production being almost wholly for marine boilers, railroad locomotives and other essential work. Discounts on boiler tubes are given on page 1179.

Shafting and Screw Machine Stock.—The demand for screw machine stock is particularly heavy, due partly to increasing shell production, large quantities of this product going into the manufacture of detonators, fuses, adapters, etc.

For fourth quarter we quote cold-rolled shafting at 17 per cent off list in carloads and 12 per cent in less than carloads, f.o.b. Pittsburgh.

Wire Rods.—Production of open-hearth wire rods continues at a low rate. One of the independent steel companies is still operating its wire department at only 35 per cent of capacity. While the leading interest is working at about 40 per cent of capacity a considerable portion of its output is made from Bessemer steel. An easing up of the situation may soon be expected, however, as is noted more fully in the paragraph on wire products. Prices on wire rods are given on page 1179.

Wire Products.—Events this week seem to indicate that the wire industry will be one of the first to adjust itself to a peace-time basis. The American Steel & Wire Co. has ordered a part of its salesmen to report for duty and a conference of the district sales-managers of this company is to be held in New York on Wednesday to formulate a sales policy. An easing up in the wire situation is a result of the cancellation of orders for military barbed wire, for which there will not be use even though the war should continue, as barbed wire is used in defensive fighting and from now on it appears the Allies will be entirely on the offensive. Orders aggregating 137,000 tons were distributed a few weeks ago among the wire mills, and of this amount 22,000 tons were for Great Britain, 54,000 tons for Italy and 50,000 tons for France. The British Government has formally cancelled its quota and the Italian Government has permitted negotiations to lag, and the trade understands that this tonnage will also be cancelled. The 50,000 tons for France was to have been delivered in the first six months of 1919, and there is said to be no likelihood that it will ever be shipped or even made. No cancellation orders from the United States Government are reported, but it is presumed these will follow as a matter of course. Wire makers are continuing the production of shell rounds without abatement. The Donora plant of the American Steel & Wire Co. is being equipped for shell work, scheduled to begin Jan. 1, but if the war should end speedily, it is presumed that this project will be abandoned. Prices on wire products are given on page 1179.

Bolts, Nuts and Rivets.—Government orders received during the past week have shown a slight falling off, but inquiries were sent out for 2,888,000 machine bolts, 1,680,000 tire bolts, 2,271,000 stove bolts and 500,000 carriage bolts. Bids on this material were closed by the Hardware and Metals Division of the Quartermaster's Department in Washington on Nov. 4. A large quantity of boiler and hull rivets is required by the Navy Department, bids to close Nov. 15. Prices are given on page 1179.

Spikes.—The Government has recently been in the market for 12,000 tons of railroad spikes for shipment to France, but orders have not been distributed so far as known here. This tonnage of spikes would be a record breaker, being sufficient for about 4,000 miles of track.

Standard sizes of railroad spikes 9/16 x 4½ in. and larger, $3.90 per 100 lb. in lots of 200 kegs of 200 lb. each, or in larger lots. Boat spikes, $5.25 per 100 lb.; rack bolts, $4.90 base in lots of 200 kegs or more; less than 200 keg lots, $1 per 100 lb. extra. All f.o.b. Pittsburgh.

Sheets.—Production of sheets continues on about a 50 to 60 per cent basis, there being no marked improvement in the supply of sheet bars. Shipments continue fairly heavy on A and B priorities, with very little, if any, left for consumers taking the automatic C classifications. Prices are given on page 1179. Sheet makers are very little concerned over the coming of peace, most of them being sold up four or five months ahead at the present rate of production. As all contracts made for sheets in the last 18 months have been non-cancellable they expect steady operation throughout the readjustment period.

Iron and Steel Bars.—It is stated here that a price of 4.25c. per lb. for bar iron made from selected scrap has been approved by the Committee on Steel and Steel Products, American Iron and Steel Institute. Demand for bar iron continues very active. The steel bar situation is very quiet, production being greatly curtailed, practically all producers being very fully engaged on shell steel.

We quote soft-steel bars rolled from billets at 2.90c.; from old steel rails, 3c.; common iron bars, 3.50c.; bar iron rolled from selected scrap, 4.25c.; and refined iron bars at 5c., at mill, Pittsburgh, for fourth quarter.

Tin Plate and Terne Plate.—The Conservation Division of the War Industries Board continues to work out regulations for the conservation of tin plate. Oil companies are to be permitted to use a partial supply of tin plate for manufacture into cans and the details of the apportionment are being worked out by the subcommittee on tin plate of the American Iron and Steel

Institute. Packers of dried beans are to be permitted a supply for three months. By the restrictions now being introduced, the War Industries Board expects to save 150,000 tons of steel during the last three months of the year. We quote tin plate at $7.75 per base box for fourth quarter. Prices on terne plate are given on page 1179.

Hot-Rolled Strip Steel.—Strip steel makers have been informed that the Ordnance Department has ordered the substitution of aluminum for strip steel in the manufacture of fuse sockets. A few orders for strip steel for this week have been cancelled and others will probably follow. A shortage of billets continues to be a restrictive factor, but the influenza epidemic has also cut down production somewhat. The War Industries Board has notified a maker in this district that it must depend on its regular sources of supply for 4x4 in. billets. The strip steel makers' stock had run dangerously low, and an appeal was made to Washington for relief.

We quote hot-rolled strip steel at $3.50 per 100 lb., Pittsburgh, for third quarter, 50c. per 100 lb. additional being charged for special stamping quality.

Cold-Rolled Strip Steel.—Production continues at 50 per cent or less, the demand for cold-rolled being much lighter than for hot-rolled.

We quote cold-rolled strip steel at $6.50 base per 100 lb., f.o.b. Pittsburgh, for 1½-in. and wider, 0.100 in. and thicker, hard temper in coils under 0.20 carbon. Boxing charge 50c. per 100 lb.

Old Material.—Scrap dealers are marking time until there is a more definite prospect of peace. They continue to buy very cautiously, not contracting more than one or two weeks ahead. In most instances, they are handling only scrap that is loaded on cars and ready for shipment. A large consuming interest made a contract on Saturday for a considerable tonnage of heavy melting steel at the maximum price of $29. Dealers expect that the market will soften when peace with Germany comes, but there are no tangible evidences as yet of a weakening in the market. The monthly list of the Pennsylvania Railroad is extremely small, about 1200 tons in all.

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$29.00
No. 1 cast scrap (for steel plants)	29.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., Franklin, Pa., and Pittsburgh	34.00
Hydraulic compressed steel scrap	29.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	29.00
Bundled sheet stamping scrap	$22.00 to 23.00
No. 1 busheling scrap	28.00 to 29.00
Railroad grate bars	28.00 to 29.00
Low phosphorus melting stock (unguaranteed)	34.00
Low phosphorus melting stock (guaranteed)	36.50
Low phosphorus melting stock (bloom and billet ends, heavy plates)	39.00
Iron car axles	46.00 to 46.50
Locomotive axles, steel	46.00 to 46.50
Steel car axles	46.00 to 46.50
Railroad malleable (for malleable works)	34.00
Machine shop turnings	19.00
Cast iron wheels	29.00
Rolled steel wheels	36.00
Sheet bar crop ends (at origin)	35.00
Cast iron borings	19.00
No. 1 railroad wrought scrap	34.00
Heavy steel axle turnings	24.00
Heavy breakable cast scrap	28.00 to 29.00

Hoops and Bands.—Production continues to be very much restricted, but demand is not large. We quote 3.50c. for fourth quarter. The Director of Steel Supply, Washington, is inquiring for slag, discard steel, scrap or other materials suitable for ship ballast.

Ferroalloys.—The market continues very quiet. There is practically no demand from consumers who are well covered for the remainder of this year, and who apparently do not wish to anticipate their requirements for next year under present conditions. One large maker of 50 per cent ferrosilicon, through its selling agent here, is quoting $155 per ton for large lots, and $160 per ton in carload lots for 1919 shipments. Although the market for ferromanganese and spiegeleisen continues weak, there have been no sales reported at below $250 delivered for 70 per cent ferromanganese, and $75 f.o.b. furnace for 16 to 18 per cent spiegeleisen.

We quote 70 per cent ferromanganese at $250, delivered, and 16 to 18 per cent spiegeleisen, $75, f.o.b. furnace, an addition or deduction of $3.50 per unit being made, when the manganese content is above or below the standard. For delivery over the remainder of the year, and for next year, 50 per cent ferrosilicon is quoted at $150 to $155.

We quote 9 per cent Bessemer ferrosilicon at $55; 10 per cent, $57; 11 per cent, $60.30; 12 per cent, $63.60. We quote 6 per cent silvery iron, $42; 7 per cent, $43; 8 per cent, $45.50; 9 per cent, $47.50; 10 per cent, $50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2.90 per gross ton, for delivery in the Pittsburgh district.

Plates.—Makers of plates have no reason to believe that consumption of plates by shipyards and car and locomotive builders will be materially decreased with the coming of peace. The statements from Chairman Hurley of the Shipping Board, and Director General Schwab of the Emergency Fleet Corporation, that shipbuilding will go ahead without interruption have been reassuring to plate producers.

We quote sheared plates at 3.25c., Pittsburgh mill, for fourth quarter.

Coke.—Consumers are not yet placing contracts for next year and probably will not do so until there is a further development in peace negotiations. Shipments of coke have been hindered somewhat by the inability of the railroads to provide crews for handling loads and empties with anything like the usual order as to time of placing or number of cars placed. The shortage of help on the railroads has been due to the influenza epidemic. Influenza has also had a marked effect on production in the Connellsville region. The Connellsville *Courier* estimates that in the week ending Oct. 24, the region produced 302,300 tons of coke and 234,500 tons of coal. Reduced to a coal basis, the aggregate was 688,100 tons of 29,000 tons less than the week ending Oct. 19, and 62,800 tons below the record production during the week ended Oct. 12.

We quote 48 hr. bee-hive blast furnace coke at $6; 72 hr. bee-hive foundry coke at $7 and crushed coke over ¾ in. at $7.30, all in tons of 2000 lb. at oven. We quote by-product coke at $5.70 for run of ovens and $6.70 for selected foundry in all States but Alabama and Washington. To these base prices should be added the freight rate from the competing bee-hive coke district which takes the lowest freight rates to the point where such by-product coke is produced, except that there shall be added for coke manufactured in New England 7c. for each 5c. above 60c. in the freight charges per ton (2240 lb.) of coal for water transportation on the coal used in the manufacture of such coke.

Coke production in the Westmoreland County, Pa., district broke all records the week ended Oct. 26, according to reports received by James S. Amend, district production manager. The coke output for the week was 52,197 tons, as against a previous high record of 50,800 tons. At least 200 additional miners and 60 drawers are needed to operate the ovens to capacity. A total of 119 ovens were not in blast as a result of labor shortage.

A complete survey of the manufacturing industries of the Youngstown district engaged in making war materials has been completed by H. R. Weiler of the United States Employment Service. It was found that Youngstown manufacturers require 599 skilled laborers and 1369 unskilled laborers.

The Pennsylvania Tank Car Co., Masury, Pa., has begun the erection of an addition to its plate works. The company is filling an order for tank cars for Japan. The Standard Car & Construction Co., also at Masury, is making a 200-ft. extension to its plate shop.

For a consideration of about $39,000, the Jones & Laughlin Steel Co., Pittsburgh, has acquired additional property in the Hazelwood section, consisting of lots 48 x 100 ft., 48 x 110 ft., 66 x 97 ft., and two of 22 x 95 ft.

The Petroleum Iron Works Corporation, Sharon, Pa., will build 25 houses for employees.

Chicago

CHICAGO, Nov. 4.

Though production and demand show practically no change, the proximity of peace and the results which will follow a cessation of hostilities, especially an armistice that amounts to the enemy's surrender, is the one great thought in the minds of producers of iron and steel. Should peace come, with manufacturing costs where they are (and there is no impending change likely), it is feared that domestic consumption will certainly be limited. Reducing those costs looms up as an immense task. Conceived quickly is the idea that wages must be readjusted, then it is admitted that this must be accompanied by a reduction in the cost of living, and one foresees the making of changes which would affect the entire industrial world. Universal speculation on the subject means that the expected period of uncertainty is here.

Users of plates working for the Emergency Fleet Corporation resent a suggestion that their need is not as great as it was. Not a single fabricated-steel job is reported. Steel bars, though needed in large volume for cars, are not so tight as other products, yet the makers are filled with both bars and sheets into January. Bar-iron prices have been readjusted following a meeting of Eastern and Western makers. Common bar iron is quoted as the base, or 3.50c. Refined iron made from all-selected scrap is 0.75c. over base, or 4.25c.; and refined iron made from muck bar and iron scrap is 1.50c. over base, or 5c. In pig iron a change noted is that the makers are more ready to consider inquiries than they were a few weeks ago, and the consumers, observing this, are freer in sending out inquiry. Generally, however, the pig-iron situation is unchanged. The producers are puzzling over the disposition of allocated orders if war need should quickly pass. Ferromanganese is quiet. Consumers of scrap are conservative, and several declines are shown, even cast scrap coming down a little. In view of the recent declared shortage, a surprising amount of old material is coming out.

Ferroalloys.—Standard 70 per cent ferromanganese continues quiet, this situation being intensified by reports indicative of approaching peace. Foundries are buying considerable 10 to 12 per cent electro ferrosilicon for use in place of silvery iron, it being reported in this connection that a plow company bought a tonnage at $85 for 12 per cent, this price being the base.

We quote 70 per cent ferromanganese at $250, delivered; 50 per cent ferrosilicon at $155 to $162.50, delivered, and 16 to 18 per cent spiegeleisen at $75, furnace.

Pig Iron.—Except for conjecture as to what the ultimate effect of the end of the war will be on the industry, and there is much conjecture, war news is unreflected in the market. It is asked just what will be done if a manufacturer to whom iron has been allocated by the Government finds his contract canceled and turns to the iron producer and says he has no use for the iron allocated. Heretofore, pig-iron contracts have been rigidly adhered to. The question now is, will the Government step in, and, having allocated the iron, direct that delivery be suspended? On the other hand, some big consumers say that after the war they will have more need than ever of the iron they have under contract. Aside from the possible regulation of deliveries there is the matter of prices, and here it is asserted revision should be effected gradually; and with the lowering of prices there should be a lowering of wages. In any event, overproduction is not feared for some time to come. In no direction is there any hint of cancellation, other than what might come in the future. As a rule, no sellers have changed policies, and allocations continue to be received. One Southern furnace has sold a few thousand tons for first half, with the usual provisions as to prices and delivery. It is to be noted that sellers are now considering inquiries more carefully than they did a few weeks ago, and, perceiving this, consumers are more free with their inquiries. Some high-sulphur iron has been taken at the full Government price, and, were it available, foundry iron running 2.25 and better silicon could be heavily placed. A Wisconsin shell maker to whom was allocated a large tonnage of Bessemer also received 1100 tons of silvery.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$38.70 to $39.00
Lake Superior charcoal, C to AA	40.70 to 42.00
Lake Superior charcoal No. 6	41.20 to 41.50
Northern coke foundry, No. 1, silicon, 2.25 to 2.75	41.25
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	34.00
Northern high-phosphorus foundry	34.00
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	42.00
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	40.25
Southern foundry, silicon, 1.75 to 2.25	39.00
Malleable, not over 2.25 silicon	34.00
Basic	33.00
Low phosphorus (copper free)	54.00
Silvery, 7 per cent	50.00

Plates.—Any change that may have come in the plate situation is not yet in evidence in this market. A Milwaukee company which will require several thousand tons for Emergency Fleet Corporation work was quick to protest at a suggested delay.

The official mill quotation is 3.25c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers who have stock quote 4.52c.

Structural Material.—No structural lettings are announced. Building propositions not essential to the war meet no more consideration than heretofore. The non-war construction bureau of the Illinois State Council of Defence since late September has received requests for 600 permits, only about 10 per cent of which have been granted. Material for 40,000 cars to go to France is being allocated.

The official mill quotation is 3c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 4.27c. for material out of warehouse.

Bars.—As heretofore mentioned, mild steel bars are not so heavily sold ahead as are plates and shapes, but a large independent mill is booked into January, and is considering but few priorities which come under the B classification. Bar iron manufacturers are comfortably fixed in point of orders but they are proceeding conservatively as regards the future, one evidence being their disinclination to buy scrap at present prices for future delivery. Western bar-iron makers were highly dissatisfied with the maximum prices announced Oct. 17, the announcement leaving common merchant iron unchanged at 3.50c, but fixing refined iron at 5c. The revision is said to have been formulated by Eastern manufacturers and the American Iron and Steel Institute representatives, and while agreeable to the Eastern makers, was not so with those in the West, where steel and iron bars compete on a price basis. It is declared the interests of the entire trade were not served, and as a result a meeting of makers from both the East and the West was held. The base for common bar iron stands, but a new classification covering refined iron made from all-selected scrap was made and its price fixed at 75c. over the base, while refined iron made from muck bar and iron scrap is $1.50 over base. Rail carbon bar manufacturers find no relief in the matter of re-rolling rails.

Mill prices are: Mild steel bars, 2.90c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; discard bars, 3.25c., Chicago; common bar iron, 3.50c., Chicago; refined iron bars, 4.25 to 5c.; rail carbon, 3c., Chicago.

Jobbers quote soft steel bars, 4.17c., bar iron 4.17c. for ¾ in. thick and heavier. Reinforcing bars, 4.29½c. base. Under the new price there is no charge for twisting, but extras for sizes are quoted as per card. Shafting, list plus 13 per cent.

Sheets.—A prominent local maker of sheets has sufficient orders to carry its mills into January, this including more with a B rating than exists in other products. For mill prices see finished iron and steel f.o.b. Pittsburgh.

Chicago delivery out of stock regardless of quantity, No. 10 blue annealed, 5.52c.; No. 28 black, 6.52c., and No. 28 galvanized, 7.77c.

Wire Products.—The leading interest, anticipating a situation where it will have more to sell, is sending out some of its salesmen who were withdrawn from the road when war demand absorbed the bulk of ca-

While no confirmation is obtainable that military wire contracts have been cancelled, it is admitted that some expected allocations have not been placed and it is improbable that they will be cancelled. The feeler sent out in the trade are to weigh the situation as it exists with consumers and pave the way for a more active domestic business.

Cast-Iron Pipe.—Akron, Ohio, which has been in the market for 5050 tons, has re-advertised and will again take bids, the new date being Nov. 15. The United States Cast-Iron Pipe & Foundry Co. has received an order for 450 tons of 48-in. pipe for delivery to the nitrate plant at Toledo, Ohio.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $69.80; 6-in. and larger, $66.80; also cast gas pipe, $1 extra.

Rails and Track Supplies.—No change is reported, and the railroads find no encouragement in regard to the rail orders they would like to place, the taking of which is precluded by the filled condition of the mills.

Standard railroad spikes, 3.90c., Pittsburgh. Track bolts, with square nuts, 4.90c., Pittsburgh. Tie plates, steel, 3.25c.; soft steel iron, 3.75c.; f.o.b. maker's mills. The base for light rails is 3c., f.o.b. maker's mill, for 25 to 45-lb. sections, lighter sections taking Government extras.

Bolts and Nuts.—The producers find material as difficult to obtain as at any time heretofore. There production has been materially cut down by influenza, but that trouble is rapidly passing. Deliveries are made only to satisfy essential needs. For mill prices see finished iron and steel, f.o.b. Pittsburgh.

Structural rivets, 5.67c.; boiler rivets, 5.77c.; machine bolts up to ⅞ x 4 in., 37½ per cent off; larger sizes 25 and 5 off; carriage bolts up to ⅞ x 6 in., 32½ off; larger sizes, 25 off; box pressed nuts, square, tapped, 7.8c. off; hexagon tapped, 7.8c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras for nuts are canceled.

Old Material.—Conservatism on the part of consumers has made the entire market weak, and several price recessions are shown, although melting steel holds up fairly well. The bar-iron mills show a pronounced tendency not to buy ahead. Fair quantities are being shipped East on permits. The extent to which material has appeared after the recent reported scarcity is called surprising. The railroad offerings comprise a good-sized total. The North Western closed against a good-sized list last week, and in most instances obtained maximum prices. Other lists have been issued by the C. & E. I.; Erie, Santa Fe, Union Pacific, Chicago & Great Western, New York Central Lines, C. & A., and Pennsylvania Lines.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Old iron rails	$39.00
Relaying rails	$55.00 to 60.00
Old carwheels	29.00
Old steel rails, rerolling	34.00
Old steel rails, less than 5 ft.	34.00
Heavy melting steel	29.00
Frogs, switches and guards, cut apart	29.00
Shoveling steel	29.00
Heavy steel axle turnings	24.00
Per Net Ton	
Iron angles and splice bars	$34.82
Iron arch bars and transoms	41.52
Steel angle bars	30.36
Iron car axles	41.52
Steel car axles	41.52
No. 1 railroad wrought	29.86
No. 2 railroad wrought	28.96
Cut forge	28.96
Pipes and flues	25.39
No. 1 busheling	27.18
No. 2 busheling	19.50
Steel knuckles and couplers	30.36
Coil springs	30.36
No. 1 cast scrap	29.86
Boiler punchings	32.59
Locomotive tires, smooth	$40.00 to 41.00
Machine-shop turnings	16.50 to 16.96
Cast borings	16.50 to 16.96
Steel plate and light cast scrap	25.00 to 25.39
Grate bars	25.00 to 25.39
Brake shoes	25.50
Railroad malleable	30.36
Agricultural malleable	29.00 to 30.00
Country mixed scrap	21.50 to 22.00

John G. Barbour, Uniontown, Pa., has resigned from the position of fuel director for Fayette County, Pa. In this work Mr. Barbour has had supervision over coke production in the Connellsville region.

Philadelphia

PHILADELPHIA, Nov. 5.

As indicated elsewhere in this issue, keenest interest is felt in Philadelphia as to the result on the market of the expected armistice in Europe. Although opinions vary and a disastrous slump is not expected, there are unquestionable evidences of easier conditions and the prevailing opinion is that prices will decline during the period of uncertainty following the declaration of an armistice. A letter received from the War Industries Board, signed by Captain D. E. Sawyer, assistant to J. L. Replogle, Director of Steel Supply, has aroused much interest. It is as follows:

> A large tonnage of inert material is required immediately for use as ballast on ships employed in transatlantic operations. Obsolete stocks of ingots, billets or other heavy materials will supply the requirements. Also scrap can possibly be used.
>
> Advise quickly if you have any material on hand which you consider would make good ballast and, if so, quantity and nature of the tonnage.

Recipients of these letters are wondering whether the War Industries Board is endeavoring to collect ballast to send one way on vessels that will not be loaded with soldiers as they have been for many months, or whether it is expected that there will be a large reduction in the tonnage of supplies that will be shipped to Europe. It is thought that if it were intended to obtain ballast for use in the trips from Europe to this country, it would not be difficult to collect enough scrap on the battlefields to meet all requirements. If the material desired is not for use in any way except for ballast, inquiries are naturally made as to why steel as valuable as ingots and billets would be referred to, even if they are "obsolete."

The influenza epidemic has almost disappeared throughout eastern Pennsylvania, but it is noticeable in steel plants that the men are not able to do as much work as formerly. One large company at Coatesville reports that it is operating at only about 70 per cent of capacity on account of the weakened condition of its employees.

Pig Iron.—Following the recent selling of 25,000 tons of foundry grades by the leading Virginia interest, which it is understood rejected a large number of orders taken tentatively by brokers, the principal buying has been of basic, of which 18,000 tons has been taken by a central Pennsylvania consumer for the first half of next year. A sale of 2200 tons of high manganese from a Virginia furnace has been made and the same company is offering several thousand additional tons. Although shipments, as a rule, are going forward without hesitation, there have been some requests for postponements and a few foundries have declined to buy when they had the opportunity to do so, the hesitation being attributed to the talk of peace. We quote standard grades of iron for delivery in Philadelphia, except low phosphorus grades, for which f.o.b. furnace prices are quoted, the advances noted being due to increase in freight rate from Pittsburgh to Philadelphia from $3.60 to $3.90.

Eastern Pennsylvania No. 1 X	$40.41
Eastern Pennsylvania No. 2 X	39.25
Eastern Pennsylvania No. 2 foundry	38.60
Virginia No. 2 X	41.75
Virginia No. 2 foundry	40.50
Basic	36.60
Gray forge	36.60
Bessemer	38.80
Standard low phosphorus (f.o.b. furnace)	54.00
Low phosphorus (copper bearing, f.o.b. furnace)	51.00

Old Material.—Easier conditions still continue, as reported last week, and a sharp decline is expected in the event of an armistice with Germany being announced. Opinions differ as to the extent of this decline, but it would not be at all surprising to see Government prices shaded $5 within a few days after the announcement of the armistice and a further reduction somewhat later. The issuing of permits is being carefully guarded by the Sub-Committee on Scrap Iron and Steel of the American Iron and Steel Institute in order to prevent speculation. The newly established scrap section of

the War Industries Board with W. Vernon Phillips as chief, assisted by Richard Peters, Jr., and co-ordinating members representing the Railroad Administration, Army, Navy and Emergency Fleet Corporation, is expected to render valuable service. We quote for delivery in Philadelphia and nearby points, as follows:

No. 1 heavy melting steel	$29.00
Steel rails, rerolling	34.00
No. 1 low phosphorus, heavy, 0.04 and under	39.00
Low phosphorus, 0.04 and under	36.50
Low phosphorus, 0.06 and under	$32.00 to 34.00
Old iron rails	39.00
Old carwheels	29.00
No. 1 railroad wrought	34.00
No. 1 yard wrought	33.00
Country yard wrought	29.00
No. 1 forge fire	29.00
Bundled skeleton	29.00
No. 1 busheling	31.00
No. 2 busheling	19.00 to 20.00
Turnings (for blast furnace use)	19.00
Machine-shop turnings (for rolling mill use)	19.00
Cast borings (for blast furnace use)	19.00
Cast borings (clean)	19.00
No. 1 cast (for steel plant use)	29.00
No. 1 cast (cupola sizes)	34.00
Grate bars	28.00 to 29.00
Stove plate	28.00 to 29.00
Railroad malleable (for steel plants)	29.00
Railroad malleable (for malleable works)	34.00
Wrought iron and soft steel pipes and tubes (new specifications)	33.00
Ungraded pipe	29.00

Bar Iron.—The recent action of the Government in co-operation with the American Iron and Steel Institute in fixing prices on common merchant iron and refined iron, establishing a price of $3.50 for common merchant iron and $5 for refined iron bars, has been received with general approval in Eastern territory, although the justice of the complaints made in central Western territory is recognized and the latest revision as to bar iron made from selected scrap to meet objections in the Central West is regarded as equitable.

Finished Iron and Steel.—Some cancellations on plates and shapes have been received, but in nearly every case the action is traceable to discontinuance of new construction in connection with shipyards in harmony with the policy of the United States Shipping Board. The Government is in the market for 2000 100-ton all steel hopper cars for the Virginian Railroad. We quote plates at 3.49½c.; plain structural material, 3.24½c.; soft steel bars, 3.14½c.; common bar iron, 3.74½c.; refined iron bars, 5.24½c.; No. 10 blue annealed sheets, 4.49½c.; No. 28 black sheets, 5.24½c., and No. 28 galvanized sheets 6.49½c., all Philadelphia.

Ferroalloys.—The tendency toward weakness is still marked in ferromanganese and spiegeleisen, but no sales at less than $250 delivered and $75 f.o.b. furnace have been reported, and we therefore quote 74 per cent ferromanganese at $250 delivered and 16 to 18 per cent spiegeleisen at $75 f.o.b. furnace. The general opinion is, however, that these prices could be shaded on a firm offer.

Cincinnati

CINCINNATI, Nov. 5—(*By Wire*).

Pig Iron.—An effect of a possible cessation of hostilities in Europe before the end of the year is noticed in the almost complete absence of contracting for first half shipment. A few small lots of Southern foundry iron for this year's delivery are being taken by some melters, but it is noticeable that they are not willing to accept the off grades as readily as they were a month ago. Reports as to cancellations by stove makers continue to come in but the tonnage is not large; in some cases it is stated these requests for cancellation were made because the iron bought was at a higher price than the present maximum Government figure. However, as the furnaces are unable to ship the metal to non-essential melters they are generally willing to accept these cancellations without question. A number of complaints are made as to the allocation program as now carried out; frequently a furnace is called on to supply more than double the tonnage it can produce in a given time, and while all iron makers are doing everything possible to prorate the metal on an equitable basis embarrassing situations often develop through complaints from melters who have been allocated iron that cannot be delivered. The influenza epidemic is disappearing and the output of iron is showing some improvement. The coke supply is also satisfactory with the exception of complaints as to its quality. The quantity furnished now is sufficient to fill the needs of all furnaces in the different districts.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote, f.o.b. Cincinnati:

Southern coke, No. 2 foundry and No. 2 soft	$37.00
Southern Ohio, No. 2	35.00
Basic, Northern	34.00

Coke.—Reports from the Connellsville district show that the influenza epidemic is subsiding rapidly and that production in that field is materially on the increase. Wise County operators also make more favorable reports. However, there is one feature that may be considered and that is the shortage of labor that existed before the epidemic which has not been relieved to any considerable extent. Practically no Pocahontas coke is being shipped to this territory at present. Most of the local and nearby foundries have been able to accumulate a sufficient amount of fuel to carry them through the year, and they are taking shipments as fast as they can be sent forward in order to prepare against a condition such as was produced by the extreme weather the first part of the present year.

Finished Iron and Steel.—The new building regulations as outlined by the War Industries Board will doubtless have an effect on the demand for some structural material, but on account of the slow shipments from the mills jobbers are just about able to fill their most urgent orders. One feature of the new building regulations that will prove annoying is that architects and contractors must now furnish a priority order for any material purchased, no matter if the jobber knows positively that the material is wanted for absolutely essential work. Heretofore the jobber was allowed to use his judgment to some extent in filling small orders, but the new rules are so stringent that he does not now care to take any chances. Wire nails are still scarce and are quoted at $4.25 per keg base from stock. No relief has been afforded as far as the supply of barb wire is concerned.

The following are local jobbers' prices: Steel bars and small structural shapes, 4.13c. base; large rounds and squares 2 in. and over, 4.23c. base; plates, 4.48c. base; No. 10 blue annealed sheets, 5.48c.; steel bands, 3/16 in. and lighter, 4.98c. base (using the new band list). Reinforcing concrete bars, 4.25½c., and wire nails, $4.23 per keg base.

Old Material.—There is practically no demand for scrap of any kind, and as a consequence prices are weak. The dealers are not disposed to reach out for any scrap, but they are absorbing small tonnages offered from time to time at the usual market quotations. However, should any large amount of scrap be offered them it is more than probable that it would be refused under present conditions. Some hope is expressed that the situation will be cleared up before the end of the year, but, until some definite information is in hand as to what conditions will then be, no large transactions will be accepted, as the dealers are not now willing to speculate very far ahead. The following are buying market prices, f.o.b. cars Cincinnati and southern Ohio, in carload lots:

	Per Gross Ton	
Bundled sheet scrap	$21.50 to	$22.50
Old iron rails	33.50 to	34.00
Relaying rails, 50 lb. and up	44.50 to	45.00
Rerolling steel rails	31.00 to	32.00
Heavy melting steel scrap	27.50 to	28.00
Steel rails for melting	27.50 to	28.00
Old carwheels	27.50 to	28.00
	Per Net Ton	
No. 1 railroad wrought	$29.00 to	$29.50
Cast borings	12.50 to	13.00
Steel turnings	13.00 to	13.50
Railroad cast	25.00 to	25.50
No. 1 machinery	28.00 to	28.50
Burnt scrap	19.50 to	20.00
Iron axles	40.00 to	40.50
Locomotive tires (smooth inside)	35.50 to	36.00
Pipes and flues	21.00 to	21.50
Malleable cast	24.50 to	25.00
Railroad tank and sheet	20.00 to	20.50

Non-Ferrous Metal Scrap.—The market is dull and shows no sign of improvement. The nominal quotation on heavy copper is 23½c.; heavy red brass, 23½c.; heavy yellow brass, 13½c. Light copper is unchanged at 21½c. The demand from local consumers is much curtailed.

Cleveland

CLEVELAND, Nov. 5.

Iron Ore.—Lake ore shipments up to Nov. 1 amount to 56,870,871 gross tons, as compared with 54,253,598 tons in the corresponding period last year, and with 57,032,846 tons to Nov. 1, 1916. The October movement was 8,541,593 tons as compared with 8,193,892 tons in October, 1917. Indications are that the season's movement will be about the same as last year when Lake shipments amounted to 62,498,901 tons. To reach last year's total 5,628,000 tons will have to be brought down in November and December. Shipments in these months last year exceeded 8,000,000 tons. Shippers are in good shape on deliveries, this being partly due to the fact that consumers have agreed on deferred shipments on considerable ore that will not be required before the opening of the season of navigation next year, and the movement will show a sharp decline from now on. The Pittsburgh Steamship Co. is withdrawing its barges from Lake trade as fast as they reach the lower Lake ports. We quote, f.o.b. Cleveland, as follows:

Iron range Bessemer, $6.65; old range non-Bessemer $6.40; Mesaba Bessemer, $6.40; Mesaba non-Bessemer, $5.75.

Pig Iron.—More pig iron was allocated for Government requirements the past week than in any previous week since the Government began the distribution of pig iron last May. Allocations during the week amounted to 141,000 tons. On top of the 104,500 tons of iron wanted by Italy, France has asked for 26,000 tons of Bessemer iron for delivery in the next three months, and the Pig Iron Committee has been asked to allocate this iron. Allocations during the six months' period since May 1, when the distribution of iron for Government requirements was placed in charge of the Pig Iron Committee, amount to 1,619,000 tons. One-half the pig iron allocated the past week, or 71,000 tons, was low phosphorus iron, 65,000 tons of which was for the first half of 1919. Foundry iron allocations amounted to 40,500 tons, 27,000 tons of which was for next year. Other allocations included 3700 tons of charcoal iron, 2600 tons of which is for the first half; 2000 tons of basic iron all for the first half; 3900 tons of malleable iron for this year, and 20,000 tons of Bessemer iron for this year's delivery, this being part of the Bessemer iron for Italy. This was distributed among several producers and leaves 44,000 tons of Bessemer iron to be supplied for Italy. The 4500 tons of malleable iron wanted by the Italian Government will be allocated to-day, leaving 36,000 tons of foundry iron in addition to a large portion of the Bessemer iron to be disposed of by the Pig Iron Committee. While peace prospects so far are not causing any curtailment of the Government's demand for pig iron, there are indications that some consumers are not showing the anxiety to secure shipments as they have been, apparently being willing to allow their stocks to run low because of the possibility of a readjustment should the war end soon. We quote, delivered Cleveland, as follows:

Bessemer	$36.60
Basic	33.40
Northern No. 2 foundry	34.40
Southern No. 2 foundry	39.60
Malleable	33.40
Ferrosilicon, 8 per cent silicon	49.90
Standard low phosphorus, Valley furnace	53.00

Bolts, Nuts and Rivets.—The American Car & Foundry Co. has placed orders for 1000 tons of rivets, and new demand in small lots continues active. Specifications on contracts are heavy. Manufacturers' stocks of steel are getting low. The demand for bolts and nuts continues fairly heavy.

Finished Iron and Steel.—The extent to which the Government will cancel contracts when peace is assured is the subject that is at present uppermost in the minds of steel men and manufacturers of war material. While opinions vary largely, it appears to be the general belief that the Government will make cancellations slowly in order to allow manufacturers to change from war to peace work without the shock that industries might suffer should its orders be suddenly cut off in large volume. No cancellations are reported, but the attitude of the Government in respect to placing new contracts is shown in the case of a large contract for gas shells which was pending with a Toledo manufacturer; with the details all worked out satisfactorily and the contract ready for signature, the Government decided to hold up this order indefinitely. New inquiry for steel is light, but manufacturers are avoiding any let-up in Government work and are crowding the mills hard for shipments of material. The only new order of any size reported is 500 tons of screw stock placed by a Cleveland manufacturer. Some of the agricultural-implement manufacturers are declining to place contracts for next season's requirements, having decided to hold off in order to take advantage of any price concession that may follow the ending of the war. Jobbers believe that they will have less difficulty in getting material because of the new priority rules affecting jobbers' orders, and the publication of these rules has resulted in the placing of additional stock orders by jobbers. The establishment of an intermediate price of 4.25c. for iron bars made from select scrap meets the approval of Cleveland bar-iron manufacturers whose plants are not equipped to make puddle bar except in small quantities, who felt that the market for 5c. refined iron was limited and who claim that there is little profit in common bar iron at 3.50c. As they understand it, the refined iron made from select scrap will meet the requirements of the railroads which consume a large share of their product.

Steel bars, 4.07c.; plates, 4.42c.; structural material, 4.17c.; No. 10 blue annealed sheets, 5.42c.; No. 29 black sheets, 6.42c.; No. 28 galvanized sheets, 7.67c.

Coke.—Shipments from the Connellsville district have been coming forward to the foundries in such large volume that consumers generally now have good stocks, and in many cases the ovens have been requested to withhold further shipments.

Old Material.—Peace talk has had slight effect, if any, on the local scrap market. This is attributed to the fact that there is little trading except for early delivery. Stocks in mill yards are low, material is being used up about as fast as received, and mills are buying all the steel-making scrap that is offered them. Prices are firm at the Government maximum, and some dealers think they would go higher for a time rather than lower should the Government regulations be removed. Dealers are avoiding speculative trading and consequently few sales for future delivery are being made. We quote delivered in consumers' yards in Cleveland and vicinity, as follows:

Per Gross Ton

Steel rails	$28.00 to $29.00
Steel rails, under 3 ft.	34.00
Steel rails, rerolling	34.00
Iron rails	39.00
Iron car axles	46.50
Steel car axles	46.50
Heavy melting steel	29.00
Cast borings	19.00
Iron and steel turnings and drillings	19.00
Hydraulic compressed sheet scrap	28.00 to 29.00
No. 1 railroad wrought	34.00
Cast-iron carwheels, unbroken	29.00
Cast-iron carwheels, broken	34.00
Agricultural malleable	29.00 to 30.00
Railroad malleable	34.00
Steel axle turnings	24.00
Light bundled sheet scrap	24.50 to 25.00
Cast-iron scrap	29.00
Cast-iron scrap broken to cupola size	34.00
No. 1 busheling	30.00 to 31.00

Per Net Ton

Railroad grate bars	$25.00 to $25.50
Stove plate	25.00 to 25.50

Buffalo

BUFFALO, Nov. 4.

Pig Iron.—Allocations of iron have shown an increase in number; but none of them was for more than moderate tonnage. The coke situation is improving but supplies are not yet coming forward in as good volume as required to keep furnace operation at the peak. One furnace which had been banked has resumed operations and another which has been badly hampered for fuel supplies recently is again reaching nearly normal production. The Buffalo Union Furnace Co.,

which had one stack banked, has started it again and is approching full production. Little attention is being paid by furnacemen to the securing of 1919 business, as their output for a long period is provided for by allocations, and all energies are bent to getting the utmost production and forwarding to consumers with all possible dispatch. One of the Tonawanda furnaces of the Donner Steel Co., which has been on foundry iron for some time, commenced on ferromanganese today. The other Tonawanda stack of the company continues on foundry grades. The schedule of prices remains as in recent weeks as follows, f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	$37.00
No. 2 X, 2.25 to 2.75 silicon	35.25
No. 3 foundry, 1.75 to 2.25 silicon	34.00
Gray forge	33.00
Malleable, silicon not over 2.25	34.50
Basic	33.00
Bessemer	35.20
Lake Superior charcoal, regular grades, f.o.b. Buffalo	38.50

Old Material.—Local dealers are affected seriously by the new ruling just issued by the officials in charge of railroad transportation, effective Friday last, which prohibits the switching movement of scrap from local dealers' yards and scrap producing industries to local consumers. Undoubtedly this order is issued to conserve railroad cars engaged in local switching service for long haul uses; but it means the tying up on local delivery contracts of several thousand tons of scrap, because adequate delivery cannot be made by trucks and teams. Most of the large local consumers have no facilities for receiving scrap by the truck load, and their requirements are so heavy that it would not be practicable to receive it in this manner, even were it possible to obtain sufficient trucks to convey it, especially as some of the larger consumers are located at least ten miles from yards and shipping points. The matter has been taken up with the proper authorities by the local dealers and it is hoped and expected that some modification of the order will be secured. The demand is heavy, and unless the order is amended to allow relief, difficulty will be found in keeping up with it. The price schedule is firmly adhered to for all commodities, and is as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$29.00
No. 1 low phosphorus, heavy, 0.04 and under	39.00
Low phosphorus, 0.04 and under	36.50
Low phosphorus, not guaranteed	34.00
No. 1 railroad wrought	34.00
No. 1 railroad machinery cast	34.00
Iron axles	$44.00 to 46.00
Steel axles	44.00 to 46.00
Carwheels	29.00
Railroad malleable	34.00
Machine shop turnings	18.00 to 18.50
Heavy axle turnings	24.00
Clean cast borings	18.00 to 19.00
Iron rails	36.00 to 37.00
Locomotive grate bars	27.50 to 28.00
Stove plate	28.50 to 29.00
Wrought pipe	27.00 to 28.00
No. 1 busheling scrap	29.00 to 30.00
Bundled sheet stamping scrap	25.00 to 26.00

Finished Iron and Steel.—Operations of mills and distributers are confined almost exclusively to priority and export license business. Some of the large mills have notified their representatives that, due to the current abnormal conditions, they are not in position to apply any of their output against B classification orders. The change in the War Trade Board methods governing steel shipments into Canada, subjecting such shipments to license requirements, automatically limits exports to Canada to classification C materials. The Lackawanna Bridge Co., Buffalo, has received contract from the Filkands-Mather Co., Cleveland, for 100 tons of structural steel material for a coal mine tipple at Jefferson, Pa. Fabricators are figuring on but little structural work at present and do not anticipate they will be able to take on much general work of this class until late in the coming spring.

The Sharon Steel Hoop Co. will place two new open-hearth furnaces at Lowellville, Pa., in operation about Nov. 25. These additional furnaces will give the company a total of six.

Birmingham

BIRMINGHAM, ALA., Nov. 4.

Pig Iron.—There is evidence here and there of hesitation in the iron market. Consumers whose war-time product bids fair to cease with the declaration of peace are beginning to think of changes in the price of iron. One large melter in the Southern fields is known to have sought cancellation of his contract for the first half of 1919 under the apprehension that there will be lower prices after the productive exigencies of war have decreased. His request was not complied with, but it indicates the state of mind of scattered consumers whose eyes are already glued on peace conditions. Makers are not especially concerned in this speculation, because a large portion of their orders is allocated, but they do see the possibility of having some customers fall down if iron does go down rapidly. The general expectation seems to be that there will be a waiting period after peace shall have been declared, but that after that prices will remain steady and on present levels. Allocations are disturbing in several respects. In the first place, they have begun to interfere with prompt delivery of the requirements of regular customers. Again, in the manufacture of allocated basic, there is a lot of off-basic produced, or basic which does not fulfill the specifications, which is disposed of in the general market. Some of the prospective off-basic has been sold for 1919 delivery. As a rule, very little 1919 business has been done. Production has been greatly interfered with by the influenza. The Republic Iron & Steel Co., for this reason is still unable to blow in its third stack at Thomas. One furnace interest entered the month with but 300 tons of pig iron on yards. The Uraga Dock Yards Co., Ltd., of Japan, which is operating the rehabilitated stack at Talladega, has commenced shipping pig iron to Japan via New Orleans, permission to do so having been obtained. The furnace is producing from 80 to 100 tons per diem. The week's allocations did not approximate more than 15,000 tons, but the total allocated is now over 300,000 tons. One foundry interest operating two stacks has 30,000 tons of foundry allocations. We quote, per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry and soft	$34.00
Basic	34.00

Cast-Iron Pipe.—Pipe foundries report about as much business as they can handle with the labor available. Several sanitary shops were shut down for as much as a week, and one water-pipe concern for several days on account of influenza. The sanitary pipe jobbers hope for an early release of sufficient pig iron to provide at least a portion of much needed requirements.

Coal and Coke.—The Alabama coal output in the last week of October fell to 310,000 tons, compared with the high of 433,000 tons in July, due to the influenza. That epidemic is, however, about over and production will increase. Foundries have coke sufficient for their needs. The Imperial Coal Co. is regularly shipping coke to the nitrate works at Sheffield and some coke is moving to the Pacific Coast, Texas and Mexico.

Old Material.—The scrap market has reached the lowest ebb in some time. The Southern consumers, who have mastery of the situation as to price, are playing a waiting game even at the reduced price schedule, so that comparatively little new business has developed. Yards are much behind on delivery to them of purchased country stock on account of the influenza and other causes. We quote, per gross ton, f.o.b. Birmingham district yards, as follows:

Old steel axles	$37.00 to $40.00
Old steel rails	28.00 to 30.00
Heavy melting steel	25.00 to 26.00
No. 1 railroad wrought	29.00 to 30.00
No. 1 cast	30.00 to 31.00
Old carwheels	30.00 to 31.00
Tramcar Wheels	28.00 to 29.00
Machine shop turnings	16.00 to 17.00
Cast-iron borings	16.00 to 17.00
Stove plate	24.50 to 25.50

The Sharon, Pa., plant of the Savage Arms Corporation will be provided with a new $300,000 power plant, the contract having been let to the Stone & Webster Co.

St. Louis

ST. LOUIS, Nov. 4.

Pig Iron.—The chief activities of furnace representatives continue to be taking care of allocated lots of iron distributed by the Government authorities among the plants in the St. Louis district engaged in war or essential domestic work. Occasionally a small lot of surplus iron appears on the market, or a lot of an analysis out of the regular formulæ, but is always taken up in short order. Consumers of pig iron are working entirely on a Government basis, and in consequence there is little opportunity for special developments, though some earnest consideration is already being given by plant managements to the problems involved in an early peace or armistice declaration. Considerable interest attaches to what the Government will do in the matter of price fixing after war's demands are a thing of the past, and the disposition seems to be favorable to the Government letting go gradually of the present control to avoid any upsetting conditions.

Coke.—Shipments continue to be along the lines which have prevailed for so long and under contracts or in line with Government needs. No new features have appeared in either the metallurgical or the domestic coke market.

Old Material.—The softened condition which has been noticeable in recent weeks has continued, so far as the unloading of small dealers is concerned and there has been some further evidence, though in minor degree, in the fact that an increased number of sales to consumers were made on a basis of Government prices, without commission. However, these latter sales were not large in the aggregate. The only material in any active demand from all directions was heavy melting steel, of which there is little available. Aside from a list of 300 tons from the Clover Leaf, no railroad lists have appeared as yet this month, though some are expected before the week ends. Generally the market has been rather quiet, with no feature of real importance appearing, save that consumer demand, aside from heavy melting steel, seems to be waning slightly, possibly on the foundation of peace talk and "safety first" rather than from any slackening in consumption. We quote dealers' prices, f.o.b. customers' works St. Louis industrial district, as follows:

	Per Gross Ton	
Old iron rails	$38.50 to	$39.00
Old steel rails, rerolling	33.50 to	34.00
Old steel rails, less than 3 ft.	31.00 to	31.50
Relaying rails, standard sections, subject to inspection	55.00 to	65.00
Old carwheels	28.50 to	29.00
No. 1 railroad heavy melting steel scrap	28.50 to	29.00
Heavy shoveling steel	28.00 to	28.50
Ordinary Shoveling steel	27.00 to	27.50
Frogs, switches and guards, cut apart	28.50 to	29.00
Ordinary bundled sheet scrap	24.75 to	25.25
Heavy axle and tire turninges	21.50 to	22.00
	Per Net Ton	
Iron angle bars	$33.00 to	$33.50
Steel angle bars	29.50 to	30.00
Iron car axles	41.00 to	41.50
Steel car axles	41.00 to	41.50
Wrought arch bars and transoms	40.00 to	40.50
No. 1 railroad wrought	29.75 to	30.25
No. 2 railroad wrought	29.00 to	29.50
Railroad springs	29.75 to	30.25
Steel couplers and knuckles	29.75 to	30.25
Locomotive tires, 42 in. and over, smooth inside	38.50 to	39.00
No. 1 dealers' forge	26.00 to	26.50
Cast iron borings	16.50 to	17.00
No. 1 busheling	27.00 to	27.50
No. 1 boilers cut to sheets and rings	24.00 to	24.50
No. 1 cast scrap	29.50 to	30.25
Stove plate and light cast scrap	23.00 to	23.50
Railroad malleable	28.75 to	29.25
Agricultural malleable	26.75 to	27.50
Pipes and flues	25.25 to	25.75
Heavy railroad sheet and tank scrap	24.00 to	24.50
Railroad grate bars	21.50 to	22.00
Machine shop trimmings	16.50 to	17.00
Country mixed scrap	21.50 to	22.00
Uncut railroad mixed scrap	24.00 to	24.50
Horseshoes	29.00 to	29.50

Finished Products.—The finished iron and steel market remains as usual, the deliveries being under the jurisdiction of the Government and the warehouses supplying material only to essential needs. Delivery of material from warehouses is showing no improvement. For stock out of warehouse we quote as follows: Soft steel bars, 4.24c.; iron bars, 4.50c.; structural material, 4.34c.; tank plates, 4.59c.; No. 8 sheets, 5.54c.; No. 10 blue annealed sheets, 5.59c.; No. 28 black sheets, cold rolled, one pass, 6.59c.; No. 28 galvanized sheets, black sheet gage, 7.84c.

San Francisco

SAN FRANCISCO, Oct. 29.

While the German peace overtures have had no appreciable effect on the local iron and steel market, the prevalence of influenza has apparently slowed up deliveries, especially from local jobbing houses, all of which are more or less crippled by the disease. But the matter of paramount importance to the trade the past week is the announcement that the Liberty Shipyards, Alameda, are to be abandoned. Approximately $2,500,000 had been expended in construction work on the yards and a vast amount of steel and machinery had been ordered for the plant, which was expected to be the second largest in the United States. Rear Admiral H. H. Rousseau, who is civil engineer member of the Federal Commission on additional navy yard sites, arrived here recently, and confirmed the report which had preceded his coming.

Bars.—The bar market is unchanged. The supply for all essential war work continues sufficient and is expected to remain so as long as scrap is to be had.

Structural Steel.—It is reported that the contracting company which was building the Liberty Shipyards at Alameda had ordered 11,000 tons of structural steel for this work. Practically all this steel has been fabricated, it is said, and some of it has been shipped. This steel can doubtless be diverted to other uses, although much of it may have to be refabricated. These yards were practically the only place where structural steel was to be used at present in this State. It is said that there are two or three projects in San Francisco, which their promoters regard as essential, which would utilize some shapes, but the State Council of Defense will not give its permission for the erection of the buildings.

Plates.—All jobbers' stocks of plates are getting low, although there have recently been arrivals of orders given before the Government inaugurated its replacement order plan. The jobbers are conserving their stocks carefully and watching their sales with great vigilance.

Sheets.—The shortage has not been relieved. The Alaska Packers' Association had to flatten oil cans to patch a warehouse roof because it could not get sheet iron.

Wrought Pipe.—Words has just been received here that the Government has given the mills instructions to stop the manufacture of pipe of 3-in. and under. The supply of this kind of pipe is small in this market and the order will result in its disappearance within a short time.

Cast-Iron Pipe.—The Government plans to purchase water from the Marin Municipal Water district for use of the military station on Angel Island. Estimates are to be made as to the amount of pipe needed to bring the water from the mainland to the island.

Pig Iron.—The market remains about the same. The only pig iron coming in is on long term contracts.

Coke.—As the foundries are getting more accustomed to the northern coke and that from the Colorado fields the coke situation is becoming easier. By mixing this coke with the better grade from Alabama the users of coke are finding that they can get along.

Old Material.—It is expected that an announcement of much importance will be made shortly by W. Vernon Phillips, chief of the sub-committee on Iron and Steel Scrap, American Iron and Steel Institute. This announcement is expected to clear up the scrap situation not only in the West but throughout the country. The local situation has been improved somewhat by the importation of cast-iron scrap from the

Middle West, the problem on this coast being more a shortage of cast iron than of steel. However, the steel supplies are steadily becoming more and more restricted. So far, by a carefully devised system of manipulation, all foundries and mills that are engaged on war work have been kept running, but there has been a considerable restriction to the foundries which are doing non-essential or low classified work. Many lines of castings have been cut out entirely. As an example of the distance those in charge of scrap on the coast are going for supplies, it is pointed out that a shipload recently arrived from Alaska at Seattle and was distributed among the foundries and mills of that city. The vessel was furnished by the Emergency Fleet Corporation, and the soldiers in Alaska helped in loading the scrap as the shortage of labor delayed her stay. We quote prices of scrap per gross ton:

Scrap steel for cupola use	$34.00
First grade iron (machinery, railroad, agricultural)	34.00
Second grade (brake shoes)	30.00
Third grade (clean broken stove plates)	28.00
Fourth grade (grate bars, acid scrap, free from burned iron)	20.00

New York

NEW YORK, Nov. 5.

Pig Iron.—The market in this district is extremely dull and the waiting attitude prevails. Some sellers report that they have had no requests for holding up shipments, but others state that some such requests have been received and also that some foundries are showing less desire to place orders. It is considered probable that in the event of an armistice being declared, prices will recede slightly, but no decided slump is expected. There is general confidence in the restoration of prices after the readjustment of general conditions is well under way. We quote prices as follows for tidewater delivery for Northern and Southern grades up to Jan. 1, 1919:

No. 1 X, silicon, 2.75 to 3.25	$40.90
No. 2 R, silicon, 2.25 to 2.75	39.15
No. 2 plain, silicon, 1.75 to 2.25	37.90
No. 2 X Virginia, silicon, 2.25 to 2.75	42.95
No. 1 Southern (all rail)	43.20
No. 2 Southern (all rail)	41.70

Old Material.—The outlook for the arranging of an armistice with Germany has caused a marked halting tendency on the part of the mills, which, as a rule, are refusing to place orders for old material. The market for low phosphorus scrap is particularly dull and while maximum Government prices are still prevailing nominally, shading may be expected at any time. We quote buying prices of dealers and brokers per gross ton, New York, as follows:

Heavy melting steel	$26.12
Rerolling rails	30.80
Relaying rails	$60.00 to 70.00
Iron and steel car axles	43.40
No. 1 railroad wrought	30.90
No. 1 railroad wrought, cut to not less than 10 in. or over 24 in	35.90
Wrought-iron track scrap	28.80
Forge fire	25.00 to 26.00
No. 1 yard wrought, long	29.90
Light iron	10.00 to 11.75
Cast borings (clean)	16.85
Machine shop turnings	16.85
Mixed borings and turnings	16.85
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long	29.90
Stove plate	26.12
Locomotive grate bars	26.12
Malleable cast (railroad)	31.12
Old carwheels	26.12

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast	$34.00
No. 1 heavy cast (columns, buildings, materials, etc.), cupola size	34.00
No. 1 heavy cast, not cupola size	29.00
No. 1 cast (radiators, cast boilers, etc.)	29.00

Cast Iron Pipe.—At a conference of cast iron pipe manufacturers and officials at Washington last week it was stated by the latter that it was not intended to stop operations of any shops. It was evident that beyond this no definite policy had been decided upon and until something of a more positive character is known the market will continue in its present dull state. Government prices are $67.70, New York, for 6-in. and heavier; $70.70 for 4-in., $77.70 for 3-in., and $1 additional for Class A and gas pipe.

Ferroalloys.—Steps have been taken by the Sub-Committee on Ferroalloys, at the suggestion of the War Industries Board, to cut down the present rate of manufacture of ferromanganese and spiegeleisen and to turn several furnaces on pig iron. It is generally admitted that there is an ample supply of both of the manganese alloys, whereas it is known that pig iron is very scarce. The West End furnace at Roanoke, Va., which has been making spiegeleisen, has already been turned over to pig iron, and it is understood that another Virginia furnace will adopt the same course in the near future, as well as two or three other furnaces located in other districts. It is not surprising that this step has been taken, as the blast furnace report of THE IRON AGE for September showed an output of over 26,000 tons of ferromanganese and of nearly 40,000 tons of spiegeleisen for that month, the latter being the largest quantity ever produced in this country. The indications are that the statistics of the two for October will show even a larger total. Demand for both ferromanganese and spiegeleisen has been very light in the past week, practically no inquiries or sales of any importance having been reported. There has been the usual movement of small and carload lots. Quotations remain unchanged at $250, delivered, for 70 per cent ferromanganese and $75, furnace, for 16 per cent spiegeleisen and $82 for 18 per cent material, though it is generally acknowledged that these levels could be shaded appreciably on a firm offer. There has been no change in the 50 per cent ferrosilicon market, demand being only fair, with quotations still firm at $150 per ton on contract and at $155 to $160 for spot material. It is understood that steps are being taken by Government officials to fix a price for the 10 and 12 per cent ferrosilicon now being made by two or three companies in electric furnaces, and for which prices have been obtained considerably in excess of the analogous material made in blast furnaces and for which a fixed price has obtained for some time.

Finished Iron and Steel.—Very little is heard thus far of any cancellation of important steel products necessary to the war program, it being regarded as a little too early for any announcement of large proportions to take place. It is understood that the placing of 30,000 tons of wire rods for France has been temporarily held in abeyance and some doubt is expressed whether it will go through in its entirety. It is also stated that the 24,000 tons of barbed wire intended for the American Expeditionary Forces has been allocated only in part and some express doubt as to whether this will be completed. Already the question as to how soon general building operations outside of war requirements will be resumed is being discussed, but one authority has voiced the opinion that not much will be done until both the price of structural steel and the remuneration to labor have fallen considerably below present levels; or in other words, that it is not so much a question of steel supply released from war use as it is these two important factors. It is estimated that the Government has yet to place about 25,000 tons of steel for various propositions. In the last week very little business has come up for bids. In addition to the 2000 tons mentioned a week ago for various buildings for the Bureau of Yards and Docks for the Government at Yorktown, Va., bids were taken Monday for 200 tons for the same purpose and there is also up for bids a small amount of steel for the Navy for a building at Norfolk, Va. It is understood that a machine shop will soon be erected at the Brooklyn Navy Yard involving about 1000 tons, but that bids have not yet been asked for. The last consignments for steel for the 10,000 to 12,000 tons required for piers, storehouses and other purposes in Brooklyn have just been shipped by the American Bridge Co. A large Eastern mill has been allocated 28,000 charcoal tubes for the Italian State Railways and the same company has also

been allocated 1100 tons of alloy bars, taking up its capacity in this line for some time to come. The remaining capacity of its barbed wire department has also been absorbed until July, 1919, by recent allocations, though to what extent these will stand is a question. For locomotives for General Pershing's forces in France one of the mills of a large company will furnish 1600 steel tired wheels in addition to 4000 tires. We quote mill shipments as follows: Steel bars, 3.17c.; shapes, 3.27c.; plates, 3.52c.; common bar iron, 3.77c., and refined bar iron, 5.27c., all New York. Out-of-store prices are 1c. higher. These quotations are revised in accordance with the new freight rates to Eastern cities, effective Nov. 1 and published in THE IRON AGE, Oct. 17.

British Steel Market

Fuel Position Serious—Advance in Prices of Steel Plates, Sheets and Black Plates

(By Mail.)

LONDON, ENGLAND, Oct. 17.—Very little alteration can be detected in general conditions. A routine business is passing in pig iron where the scarcity of foundry grades is a feature. The somewhat improved fuel supply is affording a little assistance now and the proportionately excessive production of forge iron may become a thing of the past. The fuel position is undeniably serious, however. It is marvelous how such little discretion could have been used as to make a dead set on calling up the miners, for fuel is the basis of all industrial effort. Belated and half-hearted attempts are now being made to get a few men back to the pits, but the able bodied are strictly taboo and C3 men are deemed good enough for an A1 man's job. The quarterly meeting at Birmingham has just been held. Business was of course at a standstill, everybody marking time, while producers are filled with Government orders and indifferent about new contracts. The improved war outlook induces extra caution about buying ahead, but a steady hand to mouth business is in progress. In Cleveland the heavy September cancellations of foundry pig iron have made consumers doubly anxious to get full supplies this month, but it is doubtful whether the position has improved sensibly. A recent new difficulty is the car famine which is pressing consumers who have no facilities for receiving water-borne supplies. Hematite is strong, with a fair prospect of increased supplies, though there are furnaces on the West Coast which could be put in blast if fuel could be had.

There is no special change in finished iron and steel. Bar-iron makers have all the orders they can handle, and a large proportion of their October-December capacity is disposed of. Merchants can obtain hardly anything.

The Director of Iron and Steel Contracts has modified prices of steel plates, sheets and black plates, all open annealed, produced in sheet mills, 10 tons and upward of one size and thickness. The revised figures are as follows:

	£ s. d.
Over 3/16 in. thick	16.10.0 (advance 10s.)
Over 1/8 and under 16 g., inclusive	16.15.0 (advance 10s.)
Over 16 g. to 20 g.	17. 5.0 (advance 10s.)
Over 20 g. to 24 g.	17.10.0 (advance 10s.)
Over 24 g. to 26 g.	18.10.0 (advance 10s.)

The revised extras are as follows:

Close annealing	15s per ton (advance 5s.)
Painting one coat both sides ordinary paint:	
3/16 in. and thicker	40s. (advance 20s.)
24 g. inclusive	50s. (advance 20s.)
Thinner	70s. (advance 20s.)

Baldwins, Ltd., have purchased the Briton Ferry iron works for £900,000 and will run them in conjunction with their steelworks at Port Talbot and Swansea. Armstrong, Whitworth & Co. will increase their capital to £9,512,500 by the issue of 2,500,000 new £1 shares. Bolckows also intend to raise their capital by 1,000,000 new shares of £1 to be offered to existing shareholders at 2s. 6d. premium.

IRON AND INDUSTRIAL STOCKS

Higher Margin Requirements Limit Speculation —War Stocks Fall

NEW YORK, Nov. 4.

Strict control of the money supply, which went into effect to-day, has exercised a restraining influence in speculation for the last few days and caused a more or less declining market, due to liquidation necessary to some holders of stocks. On the other hand, the elimination of all enemy belligerents except Germany has caused a serious view to be taken as to which are peace and which are war stocks, with the result that most of the steel and some of the other stocks fell to new low levels for some months, U. S. Steel common going below 102.

The range of prices on active iron and industrial stocks from Tuesday of last week to Tuesday of this week was as follows:

Allis-Chalmers co.	26½- 28	Lake Supr. Corp.	16½- 17
Allis-Chalmers pf.	79¾- 80	Midvale Steel ..	43 - 46
Am. Can com....	42 - 46¾	Nat-Acme	31 -
Am. Can pf.....	93 - 94⅞	Nat. Enam. & Stm. com.	44 - 45
Am. Car & Fdry. com.	83 - 86½	Nat. Enam. & Stm. pf.	91½-
Am. Car & Fdry. pf.	108⅞-110¼	N. Y. Air Brake..	99¾-112
Am. Loco. com...	64 - 65⅝	Nova Scotia Steel	60 -
Am. Loco. pf....	99½-100	Pressed Stl. com.	66½- 68
Am. Ship com..113	-115	Ry. Steel Spring com.	65¾- 67⅝
Am. Steel Fdries.	85 - 90½	Ry. Steel Spring pf.	100½-101½
Bald. Loco. com.	76¾- 82⅝	Republic com. ...	78¼- 83
Bald. Loco. pf..102	-102½	Republic pf.	99⅝-100
Beth. Steel com..	617⅛- 69½	Sloss com.	50½- 53
Beth. Stl. Cl. B..	61⅜- 69½	Sloss pf.	90 -
Chic. Pneu. Tool.	62¾- 65	Superior Steel..	35¼- 37⅝
Colo. Fuel	39⅛- 40	Un. Alloy Steel..	36⅞- 38¼
Cruc. Steel com..	53 - 56⅞	U. S. Pipe com..	14 - 14⅝
Cruc. Steel pf....	88 - 89½	U. S. Pipe pf....	43½- 44
Gen. Electric....	152¼-155	U. S. Steel com..	100¼-106
Gt. No. Ore Cert.	30½- 32	U. S. Steel pf...	111⅜-112⅝
Gulf States Steel	63¾- 69¼	Va. I. C. Coke..	69 - 70
Int. Har. com....	105 -108¼	Westingh. Elec...	43 - 44¼
Int. Har. pf....	109 -109¼		
Lackaw. Steel...	71⅜- 74¼		

Dividends

The Canada Foundries & Forgings, Ltd., quarterly, 3 per cent on the common and 1¾ per cent on the preferred, payable Nov. 15.

The Eastern Steel Co., quarterly, 2½ per cent on the common, payable Jan. 15, and 1¾ per cent on the first and second preferred, payable Dec. 16.

The Inland Steel Co., quarterly, 2 per cent, payable Dec. 2.

The International Harvester Co., quarterly, 1¾ per cent on the preferred, payable Dec. 2.

The Penn Seaboard Steel Corporation, quarterly, $1.50, payable Nov. 1.

The Pittsburgh Steel Co., 1¾ per cent on the preferred, payable Dec. 1.

The Savage Arms Corporation, quarterly, 1½ per cent on the common, 1¾ per cent on the first preferred and 1½ per cent on the second preferred, all payable Dec. 15.

The Standard Sanitary Mfg. Co., quarterly, 1½ per cent and extra 1 per cent on the common, payable Nov. 9; extra 2 per cent on the common, payable Dec. 10, and 1¾ per cent on the preferred, payable Nov. 9.

The Question of Government Readjustments

E. S. Fechheimer, secretary and treasurer Winslow Bros. Co., 4600 West Harrison Street, whose munitions department is engaged in making shells, states:

"We read our contract to mean that full and fair reimbursement will be allowed for increased facilities, raw material on hand, unfinished products, with recognition of services rendered, should the contract be canceled. It seems unlikely, however, even should Germany surrender to-morrow, that the Government would abate munitions manufacture to any considerable extent for several months after peace has come. Even with immediate peace on our own terms it is impossible to think we should be so idealistic as not to be prepared for deception. We must have a reasonable reserve of armament; the country will not again consent to unpreparedness. It is only prudent to keep fully equipped firemen on the job for some time after a conflagration has been extinguished. It is apt to break out again unless they are there to check it. The Government presumably will fix a date when munitions work will cease, and fix it sufficiently in advance to allow for adjustment on a peace basis."

Crucible Steel's Annual Report

The eighteenth annual report of the Crucible Steel Company of America, covering operations for its fiscal year ended Aug. 31, 1918, shows gross profits of $19,939,225.67 and net profits of $13,812,127.97. The balance sheet sets forth among assets $15,853,573.07 invested in and advanced to associated companies, $1,047,886.82 in scrip redemption fund, $3,654,661.88 cash in banks and on hand, $17,845,794.48 accounts and bills receivable, $18,908,355.78 inventories of raw material, finished products, etc., and $389,150 Liberty loan bonds. The liabilities include accounts payable, $4,719,841.86; accrued taxes and interest, $9,880,801.68; reserves of various character, $7,530,309.98. Of the surplus, $30,000,000 has been appropriated for and invested in additions to property and working capital, leaving an unappropriated surplus of $8,325,592.28.

A statement by Herbert Du Puy, chairman, and O. H. Wharton, president, accompanies the financial presentation, setting forth conditions and improvements at the company's different plants, from which the following extracts are taken:

During the year important and tremendously expensive demands have been made upon our plants and resources by governmental requirements.

To meet these large additions have had to be built and new developments made, incurring the expenditure of millions of dollars.

Without these extensions the company could not continue its aid to the Government in securing certain grades of high quality steel, for which we have the greatest reputation. In fact, the Government looks chiefly to our mills for its ever-increasing supply, thus making these new additions mandatory.

To give the reason for making these constructional outlays, it is only necessary to say that the one blast furnace at our Midland plant produces less than 50 per cent of the requirements of pig iron needed for this company's consumption. As the country's total pig iron output was shown to be inadequate to meet the nation's needs, the management, anxious to carry out its pledge to the Governcent of 100 per cent steel production, was compelled to contract for an additional blast furnace at our Midland plant, which layout will necessitate the expenditure of some $2,000,000.

The building of the blast furnace carries with it the necessity of adding a by-product coke plant of corresponding capacity, through which our company will secure its coke, gas and tar fuel for its own use, and, at the same time, furnish to the Government the chemical by-products, of which it is so greatly in need. To accomplish this construction, for which contracts have already been made, our company will be called upon to expend during the next 12 months fully $4,000,000.

Besides these large additions to the Midland works, we have been called upon to make important extensions at our Atha works, in order to increase there the output of gun and engine forgings for naval construction.

The policy of the company as to dividends is indicated in the following excerpt from the report: "The earnings of the company have been quite satisfactory, but owing to the financial requirements to meet heavy costs of new construction, together with increased inventory outlays and heavy tax demands to be made upon us, the management has concluded that as far as possible what remains of the company's income should at this time be conservatively treated as a protection against the uncertainties of the early future. Should the war suddenly terminate there must inevitably follow a sudden shrinkage in orders, and consequently a drastic readjustment in material values from the very reason that the conditions which occasioned the rise will be reversed."

The Traylor Shipbuilding Co., Cornwells, Pa., will be among the plants building wooden vessels to be closed down at an early date, in accordance with the recent decision of the United States Shipping Board. The plant consists of ten shipways and was constructed under an appropriation of $1,000,000 from the Board. Five wooden vessels of 3500 tons each have been launched at the yard and contract for five others has been placed. It is understood that all of these ships will be completed before the yard is closed.

Carbon Steel Co.'s Report

The annual report of the Carbon Steel Co., Pittsburgh, for the year ended Sept. 30, 1918, shows net profit for the year of $3,767,062.89. Out of this have been set aside $2,081,029.02 to pay Federal income and war excess profits taxes; $192,845.39 for depreciation of plant and equipment, $100,000 for additional extensions and improvements, and $21,100 for contributions to war charities. The company has declared dividends for the year on the first preferred, second preferred and common stock amounting to $880,000, leaving a net increase for the year in the surplus account of $492,088.48.

During the year $538,558 was spent for replacements, extensions and improvements. To meet the requirements of the Government, the company's forging, heat-treating and rolling equipment was enlarged, and other new facilities were added. A large part of the cost of this is being absorbed in the cost of materials which the company is furnishing on Government contracts. A modern gas producer plant was built within the year.

The company subscribed to a total of $547,500 worth of Liberty bonds of the first, second and third issues, including a total subscription of $147,900 by employees. The company also took, with its employees, approximately $500,000 of bonds of the fourth issue. The report states that the purchase of a controlling interest in the Kittanning Iron & Steel Mfg. Co. in 1917 has proved to be wise, as through this purchase the Carbon Steel Co. has been amply supplied with both pig iron and coal. The company also reports having purchased property adjoining the present plant in Pittsburgh, comprising 34,853 sq. ft., for which $95,000 cash was paid. This property is at present under lease to the Stroh Steel Hardening Process Co. Upon the termination of the lease, it will be used for expansion of the Carbon Steel Co.'s present facilities. Last August the company purchased 103 acres of river frontage land, opposite Kittanning, Pa., at a cost of $124,400, as a dumping ground for mill refuse.

During the past year J. Ramsey Speer and C. F. Blue, Jr., were elected to the board of directors. Woodward Babcock resigned as director, having entered the service of the United States Government.

Reports of the Packard Motor Car Co., Detroit, and subsidiaries for the year ended Aug. 31, showed net profits of $5,616,701.57. These, with a surplus balance from last year of $9,311,541.04, less $560,000 dividends on preferred stock and $710,382 on common stock, left a surplus belance of $13,657,860.61. Current assets, including inventories and materials at plant and branches, were $36,494,581.11, while current liabilities were $13,930,423.78. The consolidated balance sheet shows gross assets of $52,879,084.65. Total capital stock issued, $19,656,930. The company has $8,000,000 7 per cent preferred stock and $11,813,430 common stock outstanding.

Price Readjustment Depends on Wages

G. H. Jones, vice-president and general manager of sales, Inland Steel Co., says: "It undoubtedly is recognized by all that prices cannot come down unless wages come down. If prices are maintained by high labor cost it may be expected that the domestic consumption of steel will be limited in many directions. Much depends on the extent to which the Government will proceed with railroad rehabilitation, construction work, etc., and to my mind it is a question how far the Government will be inclined to go with prices at their present level. If it says it will not go on with these things, then we face a deadlock until wages are readjusted, and this readjustment means that the cost of living must be reduced and commodity prices revised until the farmer is reached. All this probably means two or three months of disorganized business."

Machinists at the plants of the Standard Steel Car Co. and Spang & Co., oil well supplies, Butler, Pa., have been granted an 8-hr. working day.

OBITUARY

HENRY WRIGHT, Lima, Ohio, president Ohio Steel Foundry Co., received injuries in an automobile collision [illegible] from which he died an hour later. Frank W. Hobson, superintendent of the company's Bucyrus plant, who was riding with him, was injured, but not dangerously. Mr. Wright, who was 54 years of age, was born in Oil City, Pa., and spent the greater part of his life in the steel foundry business. He was at one time general manager of the Buckeye Steel Castings Co., Columbus, Ohio, and was associated at various times with other steel foundry plants. Eleven years ago he organized the Ohio Steel Foundry Co., which now has plants at Lima, Bucyrus and Springfield, Ohio.

FRANCIS R. CRISPEN, Allentown, Pa., secretary and director Traylor Engineering & Mfg. Co., died at his home, Oct. 26, aged 36 years, after a week's illness, starting with the influenza. He was graduated from Girard College, Philadelphia, in 1898, and engaged in legal work until 1908, when he became private secretary and counsel for Samuel W. Traylor, later becoming an official of the company. At the time of his death he was also secretary and director of the Traylor Shipbuilding Corporation and the Cement Gun Co., Inc., as well as secretary, treasurer and director of the Dewey Cement Gun Construction Co.

CHARLES RIDGELY HANSCOM, New London, Conn., ship designer and builder, died at his home Oct. 31, aged 69 years. He was born in Portsmouth, N. H., from 1880 to 1890 was a draftsman and naval expert for the United States Navy Department, Washington, and for the following six years was general superintendent of the Bath Iron Works, Bath, Me. Later he became president of the Eastern Shipbuilding Co., New London.

ALBERT K. KRAATZ, treasurer Wausau Foundry & Machine Co., Wausau, Wis., died Oct. 27, aged 35 years, from pneumonia following influenza. He was ill but six days. He was born in Milwaukee, went to Wausau in 1903, became vice-president of the company, and upon its reorganization was elected treasurer.

WILLIAM F. MOELLER, vice-president Optenberg Iron Works, Sheboygan, Wis., died Oct. 22, after a long illness with cancer of the stomach. He had been associated with the company 20 years. A week prior to Mr. Moeller's death, Henry H. Roehl, secretary of the company, died, as reported in THE IRON AGE last week.

CAPT. L. E. EISENSMITH of the United States Engineers Corps, stationed at Cincinnati, died in that city from pneumonia, Oct. 31, aged 30 years. Before becoming connected with the service he was district sales engineer at Columbus, Ohio, for the American Blower Co., Detroit. He leaves his wife and one child.

CHARLES T. PERRY, New Jersey representative of the Colonial Steel Company, died at his home in Newark Oct. 23, aged about 35 years. He had been in the service of the company for ten years and had built up a strong clientage. He leaves his wife and a son.

BISHOP WHITE, vice-president American Chain Co., Bridgeport, Conn., and treasurer Pratt & Cady Co., Hartford, Conn., died Oct. 27 in the latter city, from pneumonia. He was a director of the Colonial National Bank at Hartford, and was but 33 years old.

CHARLES STRICKLER BYGATE, president of the Charles S. Bygate Co., and president of the Pittsburgh Coal Jobbers' Association, died Nov. 3 at his home in Pittsburgh, aged 37 years. He leaves a widow, one son and a daughter.

CHARLES A. JOHNSON, aged 35 years, auditor of the United Engineering & Foundry Co., Pittsburgh, died last week at his home in that city. He leaves a widow, three daughters and a son.

JULIAN J. WASHBURN, vice-president Wiard Plow Co., Batavia, N. Y., died at his home, Oct. 29, aged 76 years. He was a Civil War veteran.

JAMES KENNEDY BRUCE, aged 30 years, head of the accounting department of the Standard Sanitary Mfg. Co., Pittsburgh, died last week from pneumonia, in that city.

GEORGE W. WILSON, for the past six years manager of the coal department of the J. H. Hillman Sons Co., died last week at his home in Crafton, Pa.

E. H. BRAGG, who was connected with the Tennessee Coal, Iron & Railroad Company, at Birmingham, Ala., died a few days ago from pneumonia.

ALPHONSE MARX of A. Marx & Sons, New Orleans, La., died Oct. 23.

Ludlum Steel Co.'s New Electric Furnaces and Additions

The Ludlum Steel Co., Watervliet, N. Y., announces the installation of one 12,000-lb. steam hammer with 72-in. stroke, with the necessary crane and gantry rigging; one vertical water-tube steam boiler, working off of waste gases from the heating furnaces, and two new heating furnaces to be used in conjunction with the new hammer. Electric motor drive, with falk gear, for the 10-in. mill, replacing one 800-hp. steam engine, has also been arranged. The steam boilers used for the steam engine will be coupled up to existing steam-hammer capacity and to three additional 1000-lb. and 1500-lb. steam hammers.

A new grinding room has just been completed, and 24 grinders installed with another 12, making 36 in all, nearing completion. This grinding room will be used exclusively for grinding high-speed steel billets. It will be fitted up with runways and other labor-saving appliances for quick handling of heavy material.

There is also nearing completion two additional 6-ton electric furnaces with an additional 10-ton crane. The new furnaces will be the Ludlum Electric Furnace Co.'s product. The total installation of electric furnaces at the Ludlum Steel Co. is now three 10-ton furnaces, three 5-ton furnaces, and 2 6-ton furnaces.

A new annealing shop has just been completed containing six 15-ton annealing furnaces, and preparations are being made for the installing of two more of the same type of oil-burning furnaces. A large, light, saw-tooth inspection building has been finished and fitted up with labor-saving appliances, cranes, and a number of power hack saws, having a floor space of over half an acre.

These new improvements which have now beeen completed will increase the company's output by more than 50 per cent. The output since this time last year has increased over 100 per cent.

Soldiers Furloughed for Factory Work

WATERBURY, CONN., Nov. 4.—(*By wire.*)—One thousand soldiers sent to this brass manufacturing district by the Government from Camp Devens, Mass., are on indefinite furlough, and they get civilian rates of pay in the factories here, and dress as civilians, as uniforms are requisitioned for army wants. The soldiers' release is not absolute, as the furlough is subject to cancellation at any time. The men are divided, 500 being at Waterbury, 300 at Waterville, 100 at Ansonia, and 100 at Torrington. Fifteen hundred more are expected from camp later, but on account of the influenza epidemic no date is assigned yet for their arrival.

D. E. Skinner, Skinner & Eddy Corporation, Seattle, Wash., is contemplating the erection of a $750,000 electric smelting furnace at Tacoma. It is stated that the Tacoma rates on power are less than the Seattle rattes, while the Seattle municipal plant has reached its capacity. The Skinner & Eddy Corporation is interested in iron-ore deposits in China and ore would be brought thence to Tacoma for the production of steel, if present plans are consummated.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Oct.	Lake	Electrolytic	New York	New York	St. Louis	New York	St. Louis
30	26.00	26.00	*75.00	8.05	7.75	8.95	8.60
31	26.00	26.00	*75.00	8.05	7.75	8.95	8.60
Nov.							
1	26.00	26.00	*75.00	8.05	7.75	9.00	8.65
2	26.00	26.00	....	8.05	7.75	9.00	8.65
4	26.00	26.00	*75.00	8.05	7.75	8.95	8.60

NEW YORK, Nov. 6.

Marked inactivity characterizes the markets which are uncontrolled, with demand and consumption very large in others. The copper market is featureless. The tin market is virtually under international control, but no prices have been fixed. The lead market is under strict regulation. Spelter is inactive and stationary. Antimony has weakened decidedly.

New York

Copper.—As the prospects for peace draw nearer speculation broadens as to the effect on the copper market. The present price of 26c. is settled until Jan. 1, and it is expected by many that it will continue at that level until the war ends. Should it last beyond that date, whether there shall be Government control of copper after peace comes is not known now but it seems probable that it will for a period at least. When a free market obtains some look for a heavy demand for copper, while others are of the contrary opinion. One seller feels that when normal times come copper will sell nearer 12c. to 15c. per lb. than at 26c. to 30c. The fact that the world output of copper, particularly that of this country, has largely expanded since the war started should be borne in mind. Casting copper is selling under the fixed maximum price at 25.50c. per lb.

Tin.—On another page of this issue appears a statement from the War Industries Board outlining the decision arrived at regarding international control of tin, but no reference to a fixed price. All licenses for importation are to be issued only to the United States Steel Products Co. and the metal will be distributed to the consumer thrugh the American Iron and Steel Institute at cost. This puts the American and Canadian importers out of business for the period of the war. How long thereafter is not known. It is arranged that import licenses can be secured by such importers for the filling of all contracts entered into prior to Oct. 1, this part of the business being carried on according to the old arrangements. In the general market offerings continue to appear of tin in transit or to arrive from those desiring to sell before absolute price control takes effect. Sales have been made at around 75c., New York, for such lots, mostly Banca and Chinese tin, but the aggregate has probably not exceeded 500 tons. The Tin Importers' Association recently formed has drafted a set of resolutions and sent them to the War Industries Board in which importers review the situation brought about by the new control and protest against what they term a monopoly of the trade by the largest consumer. Part of the resolutions appear on another page. The monthly statistics of tin show arrivals in October to have been 4260 tons with 190 tons in stock and landing. Of the total arrivals, 3575 tons came through Pacific ports. Total imports to Nov. 1, 1918, have been 51,603 tons, against 48,766 tons to Nov. 1, 1917. The London market is unchanged at £334 per ton for spot Straits.

Lead.—The situation is unchanged. Prices and distribution continue under the strict control of the Lead Producers' Committee at 8.05c., New York, or 7.75c., St. Louis. It is agreed that the output for the year is oversold and that there is no prospect of any improvement in the supply situation.

Spelter.—With very little demand from consumers or from dealers, the market is dead. Prices are practically unchanged at 8.60c., St. Louis, or 8.95c., New York, for prime Western for early delivery, with prompt at 8.65c., St. Louis, or 9c., New York. Late last week the market stiffened slightly on a little better demand with some sales at 8.75c., St. Louis, or 9.10c., New York, for prompt. December delivery is held at 8.37½c., St. Louis, or 8.72½c., New York, with first quarter at 8.12½c., St. Louis, or 8.47½c., New York, all largely nominal. The weekly Government report of output and stocks for the week ended Oct. 26 shows a decline in production of over 800 tons and in stocks of over 2400 tons, a favorable statistical situation.

Antimony.—The market is decidedly weak, with demand very light. Quotations have fallen to 10.50c., New York, duty paid, nominal, for wholesale lots for early delivery.

Aluminum.—For No. 1 virgin metal, 98 to 99 per cent pure, and for scrap, Government maximum prices prevail with 33c. per lb. asked for 50-ton lots, 33.10c. per lb. for 15 to 50-ton lots and 33.20c. per lb. for 1 to 15-ton lots.

Old Metals.—It is very hard to quote the market this week, owing to the unsettled condition. Transactions are few. Buyers are looking for bargains and sellers are unwilling generally to make much of a reduction. Dealers' selling prices are quoted, nominally without change from last week, as follows:

	Cents per lb.
Copper, heavy and crucible	26.00
Copper, heavy and wire	25.00
Copper, light and bottoms	22.50
Brass, heavy	17.25
Brass, light	13.00
Heavy machine composition	25.00
No. 1 yellow rod brass turnings	15.00
No. 1 red brass or composition turnings	23.00
Lead, heavy	8.00
Lead, tea	6.50
Zinc	7.00

Chicago

Nov. 4.—Of copper, all that can be said is that much is being used, but no essential consumer is lacking in supplies. Tin is quiet, and what demand there is is satisfied without trouble. Under Government control, the lead market is proceeding smoothly, though there appears to be more lead obtainable than at first was believed existed. Spelter is weak and quiet. Antimony has been on the toboggan, losing a cent a day at times. Tin and spelter also show declines. Old metals are lower, and in explanation thereof dealers say: "The war is over." We quote copper at 26c. for carloads and 27.30c. for part carloads; tin, 77.50c. to 80c.; lead, nominal at 7.85c. in carloads; 8.35c. per lb. for 1 to 25 tons and 8.60c. per lb. for less than 1 ton; spelter, 8.75c.; antimony, 12c. to 12.50c. On old metals we quote copper wire, crucible shapes, 20c.; copper clips, 19.50c.; copper bottoms, 17.50c.; red brass, 19.50c.; yellow brass, 14c.; lead pipe, 6c.; zinc, 4.50c.; pewter, No. 1, 40c.; tinfoil, 50c.; and block tin, 60c.

St. Louis

Nov. 4.—Non-ferrous metals have been quiet, with quotations on carload lots at 7.75c. for lead, Government figure, and 8.60c. to 8.70c. for spelter. On less than carload lots the quotations have been: Lead, 8.25c. to 8.50c. according to quantity; spelter, 9.50c.; tin, 80c., nominal; copper, 27.50c.; antimony, 17c. In the Joplin district the ore market was quiet, with zinc blende, basis of 60 per cent metal, selling down to $50 per ton, while the usual amount of top grade ore went at $75, with the average for the week for the district $56. Calamine was quiet at $30 to $40, basis of 40 per cent metal, with the average for the week at $36. Lead ore, basis of 80 per cent metal, was $100, and that was the average for the week. For miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 15c.; heavy red brass and light copper, 21c.; heavy copper and copper wire, 22c.; pewter, 50c.; tinfoil, 65c.; zinc, 6c.; lead, 6.50c.; tea lead, 5c.

The Submarine Boat Co., Port Newark, Newark, N. J., is now giving employment to women in its construction department, with pay ranging from $7 to $8 a day.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire and fence staples, $4.35; painted barbed wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$4.40 base
Large boiler rivets.....$4.50
7/16 in. x 6 in. smaller and shorter rivets..50-10 per cent off list
Machine bolts h.p. nuts, ⅜ in. x 4 in.:
Smaller and shorter, rolled threads....50-10-5 per cent off list
Cut threads .....50-5 per cent off list
Larger and longer sizes.....40-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter.....40-10 per cent off list
Larger and longer.....35-5 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.....50-5 per cent off list
Cut threads .....40-10-5 per cent off list
Larger and longer sizes.....40 per cent off list
Lag bolts .....50-10 per cent off list
Plow bolts, Nos. 1, 2, 3.....50 per cent off list
Hot pressed nuts, sq., blank.....2.50c. per lb. off list
Hot pressed nuts, hex., blank.....2.30c. per lb. off list
Hot pressed nuts, sq., tapped.....2.30c. per lb. off list
Hot pressed nuts, hex., tapped.....2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped.....2.00c. per lb. off list
Semi-finished hex. nuts:
⅝ in. and larger.....60-10-10 per cent off list
9/16 in. and smaller.....70-5 per cent off list
Stove bolts .....70-10 per cent off list
Stove bolts .....21½ per cent extra for bulk
Tire bolts .....50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. Prices on high carbon rods are irregular. They range from $70 to $80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16 in. x 4½ in. and heavier, per 100 lb., $3.30, in lots of 200 kegs of 200 lb. each, or more; track bolts, $4.90. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Effective May 21 prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I. C., $17.00; 15-lb. coating, I. C., $18.60; 20-lb. coating, I. C., $19.60; 25-lb. coating, I. C., $20.60; 30-lb. coating, I. C., $21.75; 35-lb. coating, I. C., $23.25; 40-lb. coating, I. C., $24.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. from mill. Refined iron bars, 5.00c.; common iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	1½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	34	3½ to 4½ in.	12½
2½ to 3¼ in.	24	3 to 3¼ in.	+ 5
2¼ in.	17½	2½ to 2¾ in.	+ 7½
1¾ to 2 in.	13	2 to 2¼ in.	+22½
		1¾ to 1⅞ in.	+35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅜ in.	270	2¾ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots, are as follows:

Blue Annealed—Bessemer	Cents per lb.
No. 8 and heavier	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.10
No. 30	5.20
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

No Official Peace Preparations

Washington Official Circles Becoming Concerned Lest Peace Should Come Suddenly with Its Problems Unprovided For

WASHINGTON, Nov. 5.—Events have moved so fast in Europe that official Washington is waking up with some alarm to find that it has made practically no preparation for peace. For six months observers have been pointing out the danger of that unpreparedness, but all the responsible officials have declared that its mere discussion would interfere with the work of war. Therefore nothing has been done.

Now that it threatens to be too late for genuinely constructive steps, we are informed that the next week or so probably will bring some public announcement of what is to be done. From the same sources comes the confidential information that high administration officials have been thinking about the situation. Just what they have been thinking is a secret, but certain of the advisers of the President have been trying to work out a program which will retain some of the Government control over the economic situation to tide us over the work of reconstruction.

Just what this reconstruction work will be no one seems to have a clear idea. The fact that European Governments on both sides of the war zone have been busy for years mapping out reconstruction plans seems to mean little to the officials in Washington. It is difficult to escape the conclusion that they believe a couple of days of hard thinking will enable us to catch up with the problem European officials have been working for years to solve. It is also difficult to escape the conviction that official Washington has the same feeling toward the economic aspects of peace that it had toward the economic aspects of war. It feels a certain sanctity about unpreparedness. It has such a high confidence in the enormous power of our industiral strength that it feels preparedness is unnecessary, and that there is no problem which our industries cannot meet, at fire alarm speed, without any advance preparation.

The fact that the sudden cessation of war will make an abrupt change in every line of economic endeavor does not figure in these calculations. So far the only concrete thing which seems to have been done with reference to meeting the problems of returning peace has been to assign the Council of National Defense to gather information from all departments and bureaus concerning their fitness for peace work. "An extensive bibliography, several chests full of reports, and a number of charts" are reported to be the result of this work. That is the extent of Washington's idea of preparation for a situation such as no nation in the world has ever faced. On the basis of this data it is planned, sometime in the future, to work out a program by which the existing boards and administrations can help to keep our industries on an even keel in the troubled waters of reconstruction.

There is a long list of these agencies—the War Industries Board, the United States Shipping Board, the United States Food Administration, the United States Fuel Administration, the War Trade Board, the War Labor Board, the War Labor Policies Board, the War Finance Corporation, the United States Railroad Administration, and other bodies of lesser importance. Unfortunately, as to most of these, it will require legislation to keep them alive when the war is over. The legislation which created many of them specified that the proclamation of peace shall automatically terminate their existence. Practically every one of them, however, will have to be retained to prevent a mad scramble for materials and labor from bringing panic and chaos to the economic life of the nation. The peril of strikes will be no less vital in the days of reconstruction than in the days of the war. The allocation of raw materials will be just as important if we are to prevent serious trouble in our economic life.

As matters stand to-day, however, no industry knows just what peace will bring. The question of converting pure war industries into peace structures has been left untouched by the Government. The question of resurrecting peace industries has not even been considered. No one knows where our markets will be or the demands that will be made upon us either at home or abroad. No one knows how or when our army is to be returned to the United States or when the forces we have on both sides of the Atlantic are to be demobilized and returned to work, and the great problems of new social economics so intimately bound up with the whole question of reconstruction seem to be unconsidered by those responsible for our future.

The fact that nothing has been done to show any real progress in these important questions is largely due to the fact that President Wilson's time has been completely monopolized by the war and peace developments. He has kept in touch with every move on the war board and has directed personally practically every line of communication, both with our enemies and with our friends, in Europe. As a result he has laid aside the great and pressing problems in the United States. The machinery which he has set in motion to form the basis of plans for reconstruction has had to operate without his participation. So it has brought no public results. Not until he has personally passed upon the reconstruction program will there be any announcement of its details. So far there is no inkling as to when he will be ready to determine just what machinery we should have to represent the Government's part in the task of putting our industries back on a peace basis, or helping them to meet the violent changes which peace will make in the industrial and economic situation throughout the world.

Even the reports of the various boards and bureaus dealing with the alteration in the economic aspects of the world have been exceedingly meager, as though these departments were waiting for an administration hint as to the attitude they should take in interpreting the economic news of the world.

It should therefore surprise none that Congress has done nothing. All through the war Congress has demonstrated a great unwillingness to undertake to solve problems without the complete direction and advice of the White House. There being no such direction in this case, Congress has been idle.

As if this were not enough, the election campaign has paralyzed everything that would look toward constructive work on the part of either house or either party. It was, of course, to be expected that the Democrats would wait until the President gave them a hint as to his views before they took up the Overman bill for an appointive Commission on Reconstruction. But the Republicans, despite their recent evidences of opposition to the President, have taken no steps to push the modified Weeks bill for a series of Congressional committees on reconstruction.

If the world continues to move as fast as it has in the last ten days, Congress will face a very different situation when it reconvenes after the election. W. L. C.

Iron and Steel Interests Baffled

WASHINGTON, Nov. 5—Efforts of the representatives of the iron and steel industry to find out what the Government's attitude will be in the event of peace have been just as fruitless as those of every other industry. Every question that is asked at the War Industries Board and the War and Navy departments has

been met by the declaration that "we cannot discuss the possibility of peace."

There is no doubt, however, that the imminence of a cessation of hostilities has been felt for some time. Two weeks ago Chairman Baruch of the War Industries Board issued a formal warning that the discussion of peace was even then affecting our war industries. Since that time the rapid strides of advancing Europe have increased this effect.

The various war-making departments have attempted to go ahead with their work as though there were no discussions of peace. But their efforts have not been entirely unimpeded. In many cases there has been found a marked reluctance on the part of manufacturers to accept war contracts in the face of the progress of events. This has not been helped by the Government's insistence upon including cancellation clauses in the contracts.

Efforts to find out just what the Government will do to protect the contractors against disastrous results from such cancellations have had little result. It may be stated, however, that officials are considering this question most earnestly and that everything possible will be done to prevent serious results.

It has even been suggested that the Government make use of the powers of the War Industries Board—if that body is continued into reconstruction days—to give a preference in allocations and priorities to industries which have had war contracts cancelled. This would prevent, to some extent, the penalizing of industries which have taken war contracts at a time when some of their competitors declined to accept them so that they might be free to get the first plums of returning peace.

So far the talk of peace has had little effect upon our steel output. Every industry apparently is still running at full blast, according to the reports received by the Steel Section of the War Industries Board. Acting under the inspiration of Chairman Baruch's declaration that there must be no consideration of peace possibilities, J. Leonard Replogle, director of this section, has kept everything moving at full blast. Publicly, at least, there has been no modification of the Government's steel requirements. The oversea demands, particularly for rails, have continued to increase. The retreating Germans have removed all rails and rolling stock from the territory they have evacuated and this has resulted in a continued call for such supplies.

There has been much speculation upon the effect which peace might have on the machine-tool industry. Government pressure has continued to stimulate its output. The need for an enormous supply from this industry to restore the industrial life of Belgium and northern France is looked upon by many as a promise of contined prosperity for this industry. Other observers, however, say this is liable to be over-estimated and recommend caution. The Government interest in the industry, however, still insists on looking at the problem purely from the standpoint of a stimulated war output.

Although the United States Shipping Board has rearranged a considerable portion of its program to concentrate its efforts on the output of larger ships, it is not decreasing its requiremtnts for steel. Both Chairman Hurley of the Shipping Board and Director General Schwab of the Emergency Fleet Corporation declare that every shipyard capable of efficient production will have all the work it can do for years to come. The present program, according to Chairman Hurley, calls for the production of 15,000,000 tons. So far only one-sixth has been completed. This means that to carry out the program, provided Congress consents to continue to pay the bills, 12,500,000 more tons must be added to the American merchant marine.

"The Pacific Coast must continue its pace," said Chairman Hurley, "and the yards of the East and South, as well as the Great Lakes, must increase their output. Every competent ship worker, every technical expert and every trained executive in the yards owes it to the nation to remain at his post where his services will count most until our ship construction program is completed. There is no ground for uneasiness of either labor or capital now efficiently employed in producing ships. For many years to come ships, their construction and operation, are to be of absorbing national interest."

"Until peace is concluded and until all our boys have returned to America," added Mr. Schwab, "it is vital that we keep on building ships with every ounce of our strength and energy. After that we can consider the future. But to permit enthusiasm to lag now might be fatal to our great cause. Shipbuilding, from the very start of the war, has been the essential work that would make victory possible. That is as true as it was a year ago, and will continue to be so until the last battle is fought, and we are ready to lay down our arms, the victor in this war." W. L. C.

Expressions of Chicago Manufacturers

CHICAGO, Nov. 5.—S. J. Llewellyn, president Interstate Iron & Steel Co., gives THE IRON AGE the following views, based on the probability of the War ending in the near future:

"Now that we are coming to the close of the War and the troubles incident thereto, mainly caused by unpreparedness and discrimination, the smaller manufacturers face with optimism the marvelous and wonderful changes and readjustments which are in front of them. This optimism is based on the fact that whenever the trials and difficulties have seemed too great there has been found a way out, and further, that no condition could present to the smaller manufacturer any worse problems than those he has just had to encounter and solve.

"One of the first thoughts regarding readjustment is, Will there be a panic and violent readjustment, or only a momentary pause before continuing full speed ahead? I believe that the latter will more nearly describe what is to come.

"There may be and will be slight recessions in values of iron and steel products, but considering the elements of labor rates and general costs, only the fully integrated companies will be able to afford much in this direction. We have been forced to a higher basis of values; that is, the expressions of terms of wages and commodities have so changed that it will take some years to affect or reduce them materially.

"One of the most serious phases of the readjustment will be the question of cancellations. How far will this demoralize and paralyze business relations when it is actually at hand? There should be machinery immediately available for at once adjusting differences between the contractors so that each may have justice. The American Iron and Steel Institute could do nothing better than to arrange such machinery, and be in position to arbitrate differences between buyer and seller caused by changing War conditions. Of course, there should be no such thing as a downright cancellation, or refusal to perform by either party, without full consent and liquidation of any loss or damage.

"Regarding export business, Will our scale of wages allow us to continue our exportation of iron and steel for a good length of time, or will the excessive cost of labor and transportation greatly interfere with its continuance?

"During the period of War the American Iron and Steel Institute has performed very important and valuable service for the entire iron and steel industry, and deserves the greatest praise for its work and its consideration of the many diverse and complex propositions handed to it for attention. The Institute, however, is not entirely responsive and representative of the entire industry, and in order to avoid the evils and disasters of readjustment it would seem to me that the Institute could immediately start a movement grouping the various manufacturers into bodies which would

be represented in a democratic way in the activities of the Institute. This is a great work that could be well performed, and the benefits are obvious.

"Every manufacturer should be impressed with his duty:

"First, to employ his labor profitably.

"Second, to so profitably conduct his business as to be able to pay taxes and buy bonds for the support of the Government.

"Third, to do his part in developing and conserving our great resources, one of the greatest being to conserve and return to use as much iron and steel material as it is possible, as under the most favorable conditions the country and the world will be short of iron and steel for at least a half dozen years. The War has taught us many things, and not the least is the vital necessity of conservation of iron and steel in every way possible."

Views of President of National Metal Trades Association

The following summation of present and impending industrial conditions is given by John W. O'Leary, Chicago, president National Metal Trades Association:

"We have been so busy with the development of our military program that we have had little opportunity to prepare our readjustment policies. This is unfortunate, but not so serious as would occur if there were necessity for immediate assimilation of our large army of soldiers into civil pursuits.

"The war is won, but it is not over. Democratization of monarchies is often a slow and painful process and will require attention of the armies of the Allies to avoid long suffering and distress, such as Russia is experiencing. It is not likely, therefore, that we will be confronted very rapidly with the problem of assimilation of our soldiers into civil pursuits.

"The immediate serious consideration of our policies is, however, of the highest importance, and is not made easier through our lack of definite policy in industrial relations during the war period. Some of the readjustments in wages will come naturally.

"When the demand for munitions ceases, and there is release of materials for non-war purposes, the excessive wage paid in prime war industries will be replaced by the more moderate though still high wage paid in the less essential industries, through the natural shift of labor. The continued shortage of man power, however, prior to demobilization must tend to retain wages at a high level compared with pre-war period.

"To further maintain a high wage I believe that emigration, at least for a time, of many aliens who have been beneficiaries of the war wage extremes, will exceed immigration.

The foregoing statement indicates therefore a continuous high standard of wage during the readjustment period. That such conditions will continue after demobilization does not seem possible. I feel, therefore, that employers, publicists and labor leaders must unite in a campaign of education and preparation.

"Employers should remove themselves from a defensive attitude. Restriction of production, so apparent during the war, and operating more strongly with each increase of wages, must be attacked by every one interested in maintaining a high standard of living for the employee. Restriction of hours of labor must be met by just as clear an understanding of its effect on production as its effect on the health and pleasure of the worker. It will not be as simple for us to market our merchandise against the competition of England, France and Germany, after the war, as it was in pre-war times.

"Employers will need to consider the individual worker and his interests more than ever before, and I believe they are ready and willing so to do. Such consideration will not, however, accomplish its purpose if the individual worker fails to respond with consideration of his employer's interest. The submission of either employer or employee to the disturber from outside, with no interest other than his own personal ambitions, will make only for disturbance rather than peace and good will.

"As I view it, therefore, I see little prospect of any immediate marked change in labor wage except in exceptional cases of prime war industries, such as shipyards and munition plants. I see the need of greater unity and closer affiliation of employers, striving to formulate constructive programs of industrials relation. After all, responsibility rests with those who are responsible and it behooves us to no longer leave the solution of our vital problems to those who, no matter how well intentioned, lack the knowledge and experience gained only through daily contact with the problem. Militancy on the part of employers will not cure any more than autocracy on the part of labor.

"May we advance with the times, be constructive and thoughtful of both past and future."

Conditions as to Machine Tools

A company manufacturing big lathes for Eastern delivery says that none of its orders for shell lathes has been cancelled, but that cancellations are to be expected when hostilities are definitely ended. A New England lathe maker has decided to stipulate in taking orders for munitions work that the orders are cancellable only when 25 per cent of the amount of the order is paid at time of cancellation. It is calculated that this procedure will divide the loss and prevent the machines from being thrown on the market as they would be if forced on a purchaser who has no use for them. It is understood that the purchaser who thus cancels can include the 25 per cent he pays in the amount he is to be reimbursed by the Government. A machine tool dealer for several months has been stipulating that the orders he books are non-cancellable. Should the tool builder hold him to the contract between them, the dealer will pass the burden along to the purchaser.

Some Phases of the Transition Period

PITTSBURGH, Nov. 4.—One of the officials of an independent steel company holds the view that the coming of peace will bring questions of so complex a nature to the iron and steel trade that predictions at this time are largely guesswork. The acceptance by Germany of the Allies' armistice conditions will be followed, he believes, by several months of peace negotiations, and throughout this period a degree of uncertainty is bound to exist. His own opinion—and this he believes is shared by many others in the steel industry—is that the Government should continue to exercise control over prices during the readjustment period.

Production of steel plants has been keyed up to such a high rate under war conditions that only an exceptional export demand, together with an active domestic demand, can keep mills in full operation following the war. One difficulty which the country will have to face in handling a large export demand for steel and other manufactured products, is that foreign nations are already deeply indebted to the United States, and as they cannot pay in gold, owing to depletion of their gold reserves, they must pay in merchandise. Many of the nations of the world are impoverished financially and will need financial assistance from the United States before being in a position to buy our goods.

Further, in the opinion of this manufacturer, the cancellation of Government contracts for shell steel and other distinctly war products will come gradually. It is expected that the Government will reimburse steel companies for any losses due to cancellations when the steel is in progress of manufacture. As for ship plates, structural shapes and the various forms of steel used by the railroads, he expects a continued heavy demand.

The tendency of prices for raw materials and semi-finished and finished steel after the end of the war will, he believes, be downward. Buyers will not anticipate their wants very far ahead, and will prefer to await more settled conditions. If there should be a marked falling off in business the mills will operate at a lower rate, and

this may bring about some readjustment of the present high labor wage scales. Voluntary reduction of wages on the part of labor itself would be preferable, he considers, to any enforced reduction, but voluntary reductions cannot be expected until the cost of living has been considerably decreased. With the probability of a tremendous world-wide demand for foodstuffs, there is little prospect, in his opinion, of an early readjustment of living costs to a lower basis. With wages continuing at a high rate there is the possibility that the steel industries of this country will not be able to compete with those of England, France and Germany, and his opinion is that Germany must be accorded economic equality and a supply of raw materials if she is to pay the enormous indemnities and reconstruction costs which are likely to be assessed against her.

Philadelphia Expects Prosperity After Readjustment

The prevailing opinion in Philadelphia is that distinctly easier conditions will prevail in the pig iron, finished material and scrap markets after the announcement of an armistice being arranged with Germany. Already the evidence of slowing down is apparent, and in the pig iron market some foundries engaged on essential war work are requesting the deferring of shipments of pig iron and are not eager to buy additional tonnages, while in finished materials some cancellations have been received, attributed to decisions to discontinue the erection of additions to shipbuilding plants. It should be stated, however, that the belief that prices will decline is not universal. A notable exception is a buyer for export to Italy, who confidently predicts that there will be no recession and that after a very short period of hesitation, prices of finished materials will advance rapidly, if permitted by the Government. The cancellation of orders for different kinds of equipment by the Government is more noticeable than in the case of iron and steel products. In one case, an important contract for a certain kind of equipment was cancelled and the explanation is that the relations of the manufacturer to steel companies from which he had been buying steel and to the Emergency Fleet Corporation had not been satisfactory and that the Government was very glad to take the opportunity to sever relations.

Philadelphia is an extremely important center for the textile industry and some cancellations of Government orders of this kind have attracted attention as indicating possibly what might be expected in finished iron and steel, although it is believed that the policy as to the latter will be more conservative than in the case of textile products.

As to the shipbuilding program, which is of such large importance to Philadelphia, a statement issued by Chairman Hurley of the United States Shipping Board and published in full in THE IRON AGE of Oct. 31 has been received with satisfaction. It is believed there will be little decrease in the building of ships in the Philadelphia district, but it was recognized that there is considerable uncertainty as to the future, especially as to obtaining man power for the new vessels. Doubt is expressed as to whether many soldiers or sailors will be willing to become seamen permanently.

Summing up the situation, it may be stated that Philadelphia expects there will be a period of waiting and readjustment, but looks forward confidently to great prosperity before many months have passed. As to the labor situation, it is realized that there must be some readjustment, but it is also clear that any action in the way of revision must be taken with extreme care and with a spirit of justice to all concerned.

Opinions of Cleveland Manufacturers

CLEVELAND, Nov. 5.—Following are expressions received from prominent manufacturers in this city:

W. D. Sayle, president Cleveland Punch & Shear Works Co.: "I believe the Government will stand pat on the orders already placed for practically everything, and I do not look for any further modification of the shipbuilding program. The Government needs to keep up supply of munitions, motor trucks, and other war equipment, and also to be provided with submarines and submarine chasers after peace is declared. As they get through with Government work, manufacturers will turn to the non-war essential work that will keep their plants busy. However, there must be a readjustment of prices, including wages."

D. J. Champion, president Champion Rivet Co.: "I do not think that peace will have much of an immediate effect on business. We have too much to do now to worry about the future. In our case, it will take a year to clean up all the old contracts on our books. None of these contracts is subject to cancellation."

H. B. Bole, vice-president Hydraulic Pressed Steel Co.: "I think when the war ends business will go on practically undisturbed and that the Government will allow manufacturers to finish their contracts, which will take several months. There will be a great deal of reconstruction work for this country to do abroad, and until this is completed I believe the Government will keep its fingers on the price of material and labor and not give up complete control until things are back to near normal. I look for a period of depression some time within the next five years, but do not expect it to come soon."

J. D. Cox, Jr., vice-president Cleveland Twist Drill Co.: "After peace comes there must be a readjustment of wages, but I will not predict how soon this will be effected. Wages must come down before there is much readjustment on prices of steel and manufactured goods. I look for a considerable falling off in our business when peace comes, but believe this will be in the volume of new orders rather than in cancellation of orders now on our books, which will require several months to fill. I do not believe that many of the present orders will be canceled."

United War Work Strongly Indorsed by American Iron and Steel Institute

At a meeting of the board of directors of the American Iron and Steel Institute, held Wednesday, Nov. 6, at the office of Judge Gary, the following resolution was unanimously adopted:

Resolved, That in the opinion of the members of the board of directors of the American Iron and Steel Institute, the objects of the approaching united war work campaign are of supreme importance, and should receive the cordial support of all American industries. The seven organizations through whose efforts the funds are to be raised are furnishing to the soldiers what they need above everything else to secure physical and moral health, strength and comfort, and this will be and cannot be provided in any other way than by voluntary contributions of money and labor. The number of lives saved, the suffering allayed, the mortality prevented, the general good accomplished by these organizations, cannot as yet be definitely stated, but we know they justify everything we can do in support of the work that is being done. Therefore, be it further

Resolved, That the members of the board will recommend to the companies with which they are respectively connected, and likewise they recommend to all concerns affiliated with the iron and steel industry, that at this time they contribute in their various localities as liberally as circumstances in their judgment permit. The Institute, throughout the war, has advocated its prosecution with all the forces at the command of the country until victory could be achieved and the members now have another opportunity to render efficient service.

PERSONAL

A. N. Diehl, assistant to vice-president, Carnegie Steel Co., Pittsburgh, has been appointed general superintendent of the Duquesne works, Duquesne, Pa., succeeding Edward J. Hamilton, who died recently. Mr. Diehl has been for the past year and a half assistant to vice-president, and previous to that time he was for a year and a half assistant general superintendent of the Duquesne works. For 15 years he was superintendent of blast furnaces at the same works. He is a metallurgical chemist and a graduate of State College, Pennsylvania. His first connection with the Carnegie Steel Co. was as chemist in the laboratory at Duquesne works.

A. N. Diehl

Armin A. Schlesinger, president Northwestern Iron Co., Milwaukee Coke & Gas Co., Newport Chemical Co., and numerous other industries of the Ferdinad Schlesinger group, with headquarters at Milwaukee, has accepted a commission as a captain in the chemical warfare service. Capt. Schlesinger will be stationed at Washington. His brother, Henry J. Schlesinger, vice-president and treasurer of the various industries, is a captain in the Ordnance Corps.

William J. Jones, Youngstown, Ohio, has been promoted to manager of transportation for the Carnegie Steel Co., Youngstown district, succeeding Warren F. Perry, who recently resigned to become manager of the newly created industrial relations department of the Brier Hill Steel Co. Mr. Perry was tendered a farewell reception by his associates, and was presented with a gold watch and chain and a pocket knife as evidence of their esteem.

R. F. Randolph, general superintendent Dominion Iron & Steel Co., Sydney, N. S., has resigned and has been succeeded by H. F. Rice, who has hitherto held the position of assistant general superintendent. Mr. Rice joined the forces of the company in 1903, and has filled various positions in connection with the operating side of the mills.

J. B. Hamilton, secretary and treasurer of the Wickes Machinery Co., Jersey City, N. J., has resigned to become president of the Hamilton Machinery Co. of the same city, effective Nov. 1. The Hamilton company deals in the better grades of machine tools, motors and other equipment.

B. L. Cogshall, for eleven years secretary to the general superintendent of the Gary works of the Illinois Steel Co. and a graduate of the engineering department of the University of Michigan, has been appointed manager of production of the United Alloy Steel Corporation, Canton, Ohio. He will have complete charge of the production, order and service departments.

The Chicago Pneumatic Tool Co. announces the appointment of A. M. Brown as district manager of sales, 1740 Market Street, Philadelphia, succeeding G. A. Barden, who remains in Philadelphia as sales representative for the company. For some time Mr. Brown has been located in the New York offices of the company as assistant manager of the compressor sales division.

H. L. Skinner, associated with Shibakawa & Co., Inc., New York, importer and exporter, since the inception of the firm some years ago, as sales manager, secretary and director, has resigned.

A. H. Carpenter has been appointed assistant to H. C. Sellheimer, fuel director of the Birmingham district, Alabama, in charge of the coke end.

Austin D. Smith, of David H. Smith & Sons, Inc., Brooklyn, N. Y., has gone to Washington, where he has been installed as assistant to Andrew Wheeler, chief of the Bureau of Warehouse Distribution of the War Industries Board.

At a special meeting of the board of directors of the Independent Pneumatic Tool Co., held in Chicago Oct. 30, Roger C. Sullivan was appointed a director and elected chairman of the board, also a member of the executive committee, to fill vacancies caused by the death of the late John P. Hopkins.

Clifford F. Messinger, manager of the concrete mixer department and advertising manager of the Chain Belt Co., Milwaukee, has enlisted in the Gas and Flame Division, Chemical Warfare Service, of the United States Army. He has been commissioned first lieutenant and is stationed at Camp Kendrick, Lakehurst, N. J.

L. G. Buske, who has been connected with the Shaw Electric Crane Co., Muskegon, Mich., as directing engineer and service man, has resigned and has become identified with the Champion Engineering Co., Kenton, Ohio, crane builder.

Carl E. Andrus, formerly of the sales organization of the Cleveland Hardware Co., has been commissioned as captain in the Motor Transport Corps of the army.

C. L. Eshleman, vice-president Union Metal & Mfg. Co., Canton, Ohio, has been commissioned as captain in the Ordnance Department of the U. S. Army.

H. B. Swan, Cadillac Motor Car Co., Detroit, has been elected a director of the American Foundrymen's Association.

At the annual meeting of the American Rolling Mill Co., Middletown, Ohio, held Oct. 31, the following officers were re-elected: President and general manager, George M. Verity; first vice-president, J. H. Frantz; vice-president and assistant general manager, Charles R. Hook; secretary and treasurer, R. C. Phillips, and assistant treasurer, C. W. Davis. Walter Coe McNeille, Meriden, Conn., was elected first assistant treasurer and comptroller, succeeding N. W. Collard, who recently resigned to become associated with a manufacturing firm in Detroit.

John M. Lloyd, who has been a member of THE IRON AGE staff for the past nine years as associate mechanical editor, has joined the staff of the Society of Automotive Engineers, 29 West Thirty-ninth Street, New York. He carries with him the esteem and good wishes of his associates in this office.

S. M. Marshall of Perin & Marshall, New York, who have in hand the important extension of the Tata steel plant in India, sails for England in the coming week on professional business. Mr. Perin arrives in London this month from India.

Lewis W. Francis, Witherbee, Sherman & Co., New York, has been appointed district "certifying advisor" for the metal-mining and metallurgical industries of northern New York and New England, to have charge of the furloughing to these industries of indispensable men who have enlisted in the army. George H. Crosby, Duluth, represents in the same way the iron ranges of Michigan, Wisconsin and Minnesota. The work has been organized by Director Van H. Manning of the Bureau of Mines.

John G. Shirley has accepted an appointment as production manager with the S K F Ball Bearing Co., Hartford, Conn. He was formerly assistant works manager of the Gilbert & Barker Mfg. Co., Springfield, Mass.

Minetaro Miyazeki, representing the Oriental Mfg. Co., and T. Tanaka, chief chemist Asano Portland Cement Co., Tokyo, Japan, spent several days in Milwaukee last week on their tour of the United States to investigate machinery and manufacturing plants. Nicola Tesla, noted inventor and scientist, was a visitor at the general offices and main works of the Allis-Chalmers Mfg. Co., Milwaukee, during the week.

Machinery Markets and News of the Works

TO LIMIT CANCELLATIONS

Revision of Program for New War Work Expected

Neville Island and Midvale Projects Curtailed—No Letup in Work Now in Hand—To Reallocate Alameda Equipment

First precautions are being taken by buyers of machine tools to adjust their purchases in line with early peace conditions. War plans are already being altered in keeping with the passing of Austria-Hungary and Turkey to a non-belligerent status.

Plans for the Neville Island gun and projectile plant have been revised involving the cancellation of orders for a considerable quantity of machine-tool equipment. It is probable also that the 12-in howitzer plant for the Government at the Nicetown works of the Midvale Steel & Ordnance Co., Philadelphia, will not be built.

The Government is urging no relaxation, however, in the production of machinery, and in some quarters manufacturers are being advised that there will be no letup whatever in the Government's war material program until it is positively assured that the war is over. This is borne out by the notable activity in the Chicago district in placing contracts for adapters for shells for a reported daily output there of about 22,000.

Manufacturers who have recently taken Government orders requiring additional equipment are reported to be purchasing it regardless of a possible cancellation of their own contracts. Inquiry from shell makers in some quarters, however, is stated to have been materially reduced.

A number of large projects for war work, some single cases calling for about $1,000,000 of machine tools, are marking time. No action has been reported as regards carrying out the recently announced large pistol-making program. The present pace of war work, which may be gaged by the war orders in course of production at Detroit amounting now to $1,200,000,000, will likely prove adequate without any material increase.

The recent slight curtailment in buying is evidence of a general disposition on the part of both users and sellers of machinery to meet what has appeared to them as a probable slackening in the pressure for production on account of the break in the ranks of the hostile nations. Whatever the cause, the underlying caution has been to avoid reckless buying or selling of equipment and unnecessary hardship on account of cancellations forced by a possible sudden cessation of hostilities. Opinion varies as to the aggregate of unfilled machine tool orders and how serious a situation unrestricted cancellation might develop.

Dealers have been for the most part safeguarding sales for some time by employing a non-cancellation clause in all contracts. The rigid enforcement of this provision may prove a difficult proposition in some instances, more particularly where the buyer's future business is a large consideration. To keep cancellations down to a minimum is now the ruling sentiment of the trade. One prominent machine builder is relying frankly on the Government to protect his business, and the effort being made by the Emergency Fleet Corporation to reallocate to other shipbuilders the equipment ordered for the Alameda yard is a reassuring step in this direction.

New York

NEW YORK, NOV. 4.

The effect of the collapse of Austria-Hungary and Turkey cannot be traced in the local machine-tool market in the short time that has elapsed, beyond a growing general tendency to hold up the placing of orders against large lists for forging plants to handle new war contracts which might yet be required on a revised scale of war output. It is understood that the Neville Island gun plant program will be revised to an extent involving the cancellation of considerable equipment. The 12-in. howitzer shop planned for the Nicetown plant of the Midvale Steel & Ordnance Co., Philadelphia, will probably not be built. No action is reported as yet toward purchasing tools for carrying out the new pistol contracts. The latest reports indicate that the list of machine tools for the Osgood Bradley Car Co., Worcester, Mass., originally amounting to about $1,000,000, may eventually be withdrawn. Some of the requirements have already been eliminated. So far as is known no work under way for current war needs has been interrupted. Machine-tool orders have not yet been placed for the additional machine shop at the Charlestown, Mass., Navy Yard, which will cost about $600,000 equipped, although the building contract is reported to have been let. At the Watervliet Arsenal operations are being pressed and prompt shipment of tools there is called for, but it is reported that purchasing against future needs is not active for the time being.

Cancellation of machine-tool orders, as a possible result of a sudden suspension of peace or any sudden radical reduction in war contracts is receiving the major attention of the entire trade. For the most part this contingency is provided against by employing the proviso of 50 per cent to 33⅓ per cent cash with order, balance sight draft against bill of lading. With old established customers with stable lines independent of war demand such precautions are not considered necessary by some dealers. One large dealer has for the past year or two made all quotations on the basis that the order is not subject to cancellation, and particular attention is called to this provision when the order is signed. A non-cancellation clause has been inserted by some of the largest manufacturers for the past month in all contracts taken by its agents. Most Dealers who have not done so previously now are doing so or plan to adopt such a clause immediately. One prominent manufacturer has, however, advised its staff against the introduction of a non-cancellation clause in sales contracts. It takes the stand that as the Government is the source of practically all work for which the machines are sold, future arrangements satisfactory to all can be presumed, if a reconstruction plan continuing present work over a few months should be fixed on; otherwise it believes cancellations are certain and that a proposition to refuse cancellation from contracting manufacturers would be deemed not a practicable proposition from the standpoint of future business.

Railroad buying appears more active than for some time. The Pennsylvania Railroad is understood to be buying a considerable list of machinery for its locomotive repair shop under construction at Marietta, Pa., including 20 cranes, two 200-ton, six 25-ton, etc. The Baltimore & Ohio Railroad has been buying some tools. The New York Central Railroad will place orders this week for four 10-ton cranes instead of two, originally specified for its East Buffalo car shops. Recent inquiry from the railroads has included a good lot of forging machines, mostly for estimating purposes, in establishing 1919 budgets.

Exporters are apparently preparing to take advantage of any early release of shipping to countries removed from the war. One Japanese inquiry of large scope has been submitted to a local house with a request for a report as to the best shipping dates. It is reported that the Braden Copper

Co., New York, will probably take most of the machinery it had ordered for South America and more lately held up, with the plan of storing it against a coming of peace.

Crane business is rather slack. An Ohio crane builder has been awarded 32 10-ton cranes for the Neville Island plant. J. N. Kinney, contracting engineer, 30 Church Street, New York, sales agent for the Chisholm-Moore Mfg. Co., Cleveland, has received an order for one 40-ton, one 20-ton and one 10-ton hand-operated cranes for the Chinese Government Navy Yard at Shanghai for Emergency Fleet Corporation work.

Notwithstanding the rapid steps toward peace there have been some sizable machine-tool orders placed lately. The Winchester Repeating Arms Co., New Haven, Conn., has ordered 120 Briggs milling machines. Another order for grinding machines amounts to about $58,000. The American Brake Shoe & Foundry Co. is inquiring for 25 screw machines and other equipment for work on adapters. The American Car & Foundry Co. is in the market for punches and other tools.

Kraeuter & Co., Inc., Newark, N. J., are in the market for an upright Helve-Bradley hammer of 200 lb. capacity.

The Wilsch Machine & Specialty Co., 237 Lafayette Street, New York, is seeking for immediate delivery milling machines, shapers, lathes, planers, and a large engine, preferably used tools.

The Vanderstucken-Ewing Construction Corporation, Bethlehem, Pa., is seeking to purchase beam punch and coping machine, one to punch 8 x 8 angles and beams 30 in. deep preferred.

The Duesenberg Motors Corporation, Newark Avenue, Elizabeth, N. J., has received additional contracts from the Government covering a quantity of heavy motors for tractors, and in order to increase its manufacturing facilities has taken over property for an adjoining plant near its works. The motor is reported to be of four-cylinder type, with 6½-in. bore and 7¾-in. stroke, developing about 120 hp.

The Reliable Electric Plating Co., West Orange, N. J., has been incorporated with a capital of $50,000 by Joseph and Adolph Danbeck.

The Bureau of Yards and Docks, Navy Department, Washington, has bid plans prepared for an extension to the naval training station at Cape May, N. J., to include shops and other buildings, estimated to cost $1,300,000.

The Radium Luminous Material Corporation, Boonton, N. J., is now devoting 95 per cent of its production, including radium luminous material for watch dials, compass dials for aeroplanes, etc., to Government contracts. The company has arranged for increased power facilities to provide for expansion in manufacturing.

The N. J. Specialty Co., Kearny, N. J., has filed notice of organization to operate a machine shop at 208 Schuyler Avenue for the manufacture of tool specialties, etc. John Ammann heads the company.

J. McWilliams & Son, 372 Sip Avenue, Jersey City, N. J., manufacturers of hardware specialties, have filed plans for a one-story forge shop addition to cost $8,800.

Burdick & Son, Hamilton and Mosher streets, Albany, N. Y., manufacturers of sheet-metal specialties, have awarded a contract to the McCann Building Co., Dove Street, for rebuilding their three-story works recently damaged by fire. The work is estimated to cost $25,000. It is understood the company will purchase new machinery, including metal-working apparatus, electric motors, etc.

The Weehawken Dry Dock Co., Weehawken, N. J., is said to be planning the construction of its proposed shipbuilding plant on property recently acquired at Peekskill, N. Y.

The Dorplan Motor Truck Co., Schenectady, N. Y., has been incorporated with a capital of $100,000 by G. L. Sidebothen, L. Basset, and W. Harrington, Schenectady, to manufacture motor trucks, parts, etc.

The Eastern Parts Mfg. Co., 135 Spring Street, New York, has leased property at 257-9 William Street, for increased operations.

W. H. Gahagan, Inc., 147 Remsen Street, Brooklyn, operating a shipbuilding plant at Arverne, Long Island, has purchased 240 acres with frontage on Somerville Harbor and Jamaica Bay. Plans have been filed for a shop building, 53 x 180 ft., to form the first unit, estimated to cost $27,000.

The Central New England Railway of the New York, New Haven & Hartford Railroad, New Haven, Conn., has commenced the construction of a new one-story addition to its machine shop at Maybrook, N. Y., to cost $10,000.

The Poughkeepsie Cutlery Works, Poughkeepsie, N. Y., is reported considering the construction of a four-story addition, 75 x 125 ft., on North Cherry Street. Headquarters of the company are at Indianapolis, Ind. William E. Eppert is president.

The United States Die Castings Corporation, Brooklyn, has been incorporated with a capital of $150,000 by F. Schippers, H. Willrich and F. C. Kraver, 71 Adams Street.

The American Traction Ring Co., White Plains, N. Y., has been incorporated with a capital of $10,000 to manufacture anti-skidding devices. G. Hoyt, W. G. Barrett and A. H. Atwood, White Plains, are the incorporators.

The Hacich Hacich Asbestos Mfg. Co., 607 West Fifty-fifth Street, New York, is building a three-story plant, 90 x 110 ft., at Harris Avenue and Hancock Street, Long Island City, to cost $60,000.

S. Blickman, 199 Lafayette Street, New York, manufacturer of coffee urns, has acquired an entire block bounded by Anable and Nott avenues, Manly and Mount Vernon streets, Degnon Terminal, Long Island City, for a new plant to be devoted to heavy sheet-metal stamping work. Equipment will include large stamping and drawing machines, etc.

The United Electric Light & Power Co., 130 East Fifteenth Street, New York, will build a one-story power station, 40 x 50 ft., at 201st Street and the Harlem River.

Frederick Schreiber, Long Island City, N. Y., operating a plant in the Ravenswood section for the manufacture of munitions, is planning the construction of a two-story work at Webster Avenue and Hancock Street, to cost $30,000.

The R. J. Welch Corporation, Brooklyn, has been incorporated with a capital of $9,000 by M. R. Gudrich, R. J. and C. Welch, 635 West One Hundred and Sixtieth Street, to manufacture automobile equipment.

John A. Cozzone & Co., Inc., 61 Arlington Street, Newark, manufacturer of metal products, has leased the upper floors of a four-story building at 55-57 Branford Street for extensions.

The Pole & Tube Works, Inc., Newark, has been incorporated with a capital of $35,000 by John M. Durkes and G. H. Schwarz to manufacture metal masts, etc.

The Rubber & Celluloid Products Co., Wilson Avenue, Newark, is having plans prepared for rebuilding its plant recently destroyed by fire with estimated loss of $100,000. The new structure will be one and two stories, 42 x 200 ft., estimated to cost $50,000. The main office of the company is at 56 Ferry Street. Andrew Albright is president.

The Essex Belt Fastener Co., Newark, has filed notice of organization, with capital of $100,000, by J. and William S. Andres and Adolph Helfzmann.

Thomas & Co., Newark, manufacturers of keys, etc., located for the past 50 years at 28 Mechanic Street, has removed to 144 Mulberry Street.

The White Aerial Marine Locator Co., Jersey City, N. J., has been incorporated with a capital of $5,000 by George D. White, F. G. and A. N. Seib.

The Erie Railroad, Jersey City, N. J., has taken out a permit to build a shop addition at its locomotive shops on Pavonia Avenue.

Fire, Oct. 27, partially destroyed the plant of the F. J. Rooney Lamp Co., Thirteenth Street and Willow Avenue, Hoboken, N. J., with loss estimated at $10,000.

The Gulf Refining Co., Plum Point Lane, Newark, N. J., is planning a reinforced-concrete shop, 65 x 100 ft., at 92-98 Lentz Avenue, for machine and automobile repair work. It is to cost about $10,000.

The Abrasive Machine & Supply Co., Newark, N. J., has been incorporated with a capital of $100,000 by Ralph B. Manly, Charles Knupper and Howard A. Dayer, to manufacture machinery, etc.

The American Art Metal Works, Newark, N. J., has been incorporated with a capital of $50,000 by Felix T. Jolemar, R. C. Duerr and Roy J. Harding.

The Heller Brothers Co., 879 Mount Prospect Avenue, Newark, manufacturer of files, etc., will build a one-story foundry addition at Verona and Mount Prospect avenues.

The Watercraft Construction Co., New York, is completing the construction of a new shipbuilding plant on Flushing Bay, Long Island, including shipways, forge and machine shops, etc. The company is associated with Alexander McWhirter & Co., 111 Broadway, New York.

The Ferro Marine Engine Mfg. Co., New York, has been incorporated with a capital of $10,000 by B. W. Levy, B. M. Frink, K. Jensen, 49 Fort Greene Place, Brooklyn.

The Seaboard Marine Corporation, New York, has been incorporated with a capital of $500,000 to build vessels, etc. H. M. Glennon, P. Doring and T. B. Bresnahan, 55 West 127th Street, are the incorporators.

The American Balsa Corporation, 50 East Forty-second Street, New York, has filed plans for a two-story brick addition to its plant on Exterior Street, to cost $50,000.

The New York, New Haven & Hartford Railroad, New Haven, Conn., has had plans prepared for a one-story forge shop and mill, 40 x 80 ft., at 132d Street and Harlem River, New York.

The Raritan River Railroad Co., South Amboy, N. J., has awarded contract to the Austin Co., 1319 Filbert Street, Philadelphia, for a one-story engine house at its local yards, to cost $200,000.

Oliver A. Reed, Inc., Plainfield, N. J., has been incorporated with a capital of $25,000 by Oliver A. Reed, L. A. Burnett and J. E. Watson Plainfield, to manufacture auto parts, etc.

Philadelphia

PHILADELPHIA, Nov. 4.

The Emergency Fleet Corporation has put a plan in operation that is aimed to avoid the disagreeable recourse to an out-and-out cancellation of machine-tool and crane orders for the Alameda shipyard of the Bethlehem Shipbuilding Corporation, now abandoned. When the latter was unable to secure from the Government an additional appropriation with which to complete the yard, it was instructed to reduce equipment orders to keep within the original estimate. This resulted in the first cut in these requirements. Upon the cancellation of the contracts with the Bethlehem corporation and the New York Shipbuilding Corporation for troopships, the Emergency Fleet Corporation, ordered that work on the machinery for its yards, under construction by these companies be suspended on equipment items upon which manufacture had not started. An investigation has shown that at least one manufacturer's plant was almost exclusively devoted to the Alameda work and that this order would virtually close down the plant until new business could be secured. The authority for the cancellations originally made to the "Bethlehem Shipbuilding Corporation Supt. U. S. Shipping Board Emergency Fleet Corporation" is now questioned and in the case of this one manufacturer definite instructions have been issued to complete all machines in process that can be finished this month, but to withhold shipment pending further advices. It is now understood by representatives in close touch at Philadelphia that each machinery contractor has been directed to report the exact status of such orders in his shop, that the machinery is to be completed according to the original, and that an effort will be made to distribute it among other shipyards that can use it to advantage.

The Yarnall Waring Co., Mermaid Avenue, Philadelphia, manufacturer of valves, meters, etc., has acquired about 3 acres at Mermaid Avenue and Devon Street.

The Pennsylvania Railroad, Philadelphia, has taken out permit to build a one-story engine house at Forty-ninth Street and Grays Avenue to cost $80,000.

The Philadelphia Rapid Transit Co., 810 Dauphin Street, Philadelphia, will install two 5-ton electric cranes, with steel runways, at its repair shop, Frankford Avenue and Bridge Street.

The Knot Mfg. Co., Clifton Heights, Philadelphia, will build a one-story and basement engine plant, 60 x 80 ft., for knot operation.

The Emergency Fleet Corporation, Philadelphia, has leased a building at 621-25 Reed Street, consisting of about 100,000 sq. ft. of space for general service work in connection with the local shipbuilding plants.

J. G. Brill Co., Sixty-second Street and Woodland Avenue, Philadelphia, manufacturer of cars, has awarded miscellaneous contracts for the completion of its two-story addition, now in course of erection. It will be 86 x 140 ft., and is estimated to cost $75,000.

The Sterling Equipment & Supply Co., 245 Race Street, Philadelphia, manufacturer of boiler compounds and specialties, has acquired the factory at 488-94 North American Street, formerly occupied by the Reyburn-Hunter Lightning Rod Co., for a manufacturing plant.

The Tioga Steel & Iron Co., Fifty-second Street and Lancaster Avenue, Philadelphia, will build a new water-softening plant at its gun works. Contract for the structural steel has been let to the Metz Structural Steel Co., Bridgeport, Pa.

The William Cramp & Sons Ship & Engine Building Co., Beach and Ball streets, Philadelphia, has awarded a contract to Frei A. Havens & Co., 845 North Nineteenth Street, for a one-story forge and blacksmith shop at its shipbuilding plant, to cost about $30,000.

The Keystone Lubricating Co., Twenty-first and Clearfield streets, Philadelphia, has acquired property, 20 x 225 ft., adjoining its plant at Twenty-second and Clearfield streets.

The Tacony Ordnance Co., Tacony, Philadelphia, has broken ground for its proposed additional machine shop, one-story, 75 x 128 ft., to cost $50,000.

The railroad shops and buildings now being constructed by the Pennsylvania Railroad, Philadelphia, at its South Philadelphia yards, near Greenwich Point, are estimated to cost, with equipment, about $1,000,000. Six buildings will be erected for general capacity increase. The new engine house, machine shop, general shops, power house and other structures to be erected by the company at Marietta, Pa., will cost about $500,000.

Fire, Oct. 29, destroyed the pattern shop of the Camden Iron Works, Line and Ringgold streets, Camden, N. J., with loss reported in excess of $50,000.

The J. N. L. Casting Machine Co., Philadelphia, has been incorporated with a capital of $25,000 to manufacture casting machinery. William U. Griffiths, Llewellyn, is treasurer.

Fire, Oct. 31, destroyed the works of the Broadway Auto Sheet Metal Co., 812 Broadway, Camden, N. J., with loss estimated at $10,000. H. A. Blair is head of the company.

The Pennsylvania Railroad, Trenton, N. J., is building a one-story engine house at its local yards to cost about $10,000.

The Du Pont Engineering Co. has leased a plant, including 7 acres of land, at Tullytown, Pa., near Trenton, for a new manufacturing works.

The Franklin Lead Oxide Co., Franklin, Pa., has been incorporated with a capital of $150,000, by E. J. Shaler and others.

M. Movshovitz & Son, 181 Fair Street, Trenton, N. J., operating a smelting works, have commenced the rebuilding of their plant recently damaged by fire.

The Marlin Arms Co., Breaburn, Pa., will build a one-story addition, 80 x 160 ft.

The Lebanon Steel Foundry, Lebanon, Pa., is taking bids for two additions, to consist of a two-story and basement extension, 50 x 78 ft., and one-story building, 24 x 24 ft.

The Lackawanna Shovel Co., Scranton, Pa., has been incorporated with a capital of $10,000, by Morris Miller and others, to manufacture shovels, spades, etc.

The Monongahela Railway Co., Market Street, Brownsville, Pa., has commenced the construction of a one-story erecting shop at its repair works at South Brownsville.

Buffalo

BUFFALO, Nov. 4.

The Metal & Alloy Specialty Co., 25 Illinois Street, Buffalo, is having plans prepared for a one-story foundry, 60 x 100 ft., at its new plant on Marion Avenue, near the New York Central Railroad, Black Rock cut-off. It is now building a main two-story plant at this location to be used for the manufacture of aluminum and brass airplane parts.

The Harvey-Haines Machine Co., 369 Ellicott Street, Buffalo, has increased its capital from $5,000 to $25,000.

The Crosby Co., 183 Pratt Street, Buffalo, manufacturer of steel stampings, etc., has had plans prepared for a one-story building, 100 x 125 ft., at Castor and William streets, to cost $12,000.

The Curtiss Aeroplane & Motor Corporation, Buffalo, has filed plans for a one-story addition, 20 x 185 ft., at its Elmwood Avenue works.

J. Blair Clark, Inc., Buffalo, has been incorporated with a capital of $30,000 by J. Blair Clark and J. F. Wall, to manufacture automobile and tractor parts, etc.

The Aluminum Castings Co., Harvard Avenue, Cleveland, is taking bids for a three-story addition to its Buffalo plant, 1850 Elmwood Avenue, 35 x 50 ft., to cost $10,000. R. C. Adams is manager.

The Clipper Tool Co., Buffalo, has been incorporated with a capital of $150,000, by E. E., F. E. and G. Parr, to manufacture tools, etc.

The Buffalo Dry Dock Co., Ganson Street, Buffalo, has completed plans for a two-story punch-shop addition, 70 x 150 ft., estimated to cost $20,000. It has also had plans prepared for a one-story boiler house addition, 22 x 50 ft.

The Rea's Brass Foundry Co., Manlius, N. Y., has been incorporated with a capital of $10,000 by C. J. Parker, Jr., C. Keck and J. P. Pantak, to manufacture brass and other castings.

The Crucible Steel Co. of America, 104 Magnolia Street, Syracuse, N. Y., has filed plans for three extensions to the Cayuga Tool Steel Co., Auburn, N. Y., recently acquired, and now known as the Auburn works. It is understood that other additions are contemplated.

The United States Compressing & Milling Corporation, Cayuga, N. Y., has been incorporated with a capital of $50,000 by C. H. Pratz, F. W. Shoemaker and J. P. O'Hara, Moravia, to manufacture machinery.

W. B. Whitney & Co., 38 South Dearborn Street, Chicago, are drawing plans for a manufacturing plant to be erected at Buffalo, N. Y., at a cost estimated at $100,000. Owner's name not yet announced.

The shops to be erected by the New York Central Railroad at DeWitt, N. Y., will consist of 4 buildings. The general contract has been let to the R. W. Smith Corporation, 30 Church Street, New York.

The Armour Grape Juice Co., Westfield, N. Y., is having plans prepared by James I. Clarke, architect, Chicago, for factory building to replace those recently destroyed by fire.

The Utica Duxbak Corporation, 815 Hickory Street, Utica, N. Y., has had plans drawn for a three-story brick and tile mill addition to cost $20,000. Quentin McAdams is president.

The Poughkeepsie Cutlery Works, Poughkeepsie, N. Y., is having plans prepared for a four-story factory addition, 75 x 125 ft., on North Cherry Street. William E. Eppert, Indianapolis, Ind, is president.

The Municipal Commission, Herkimer, N. Y., Michael Foley president, City Hall, has completed plans for a one-story boiler house addition, of brick and steel, to cost $50,000.

The Palitine Aniline & Chemical Co., Poughkeepsie, N. Y., C. O. Terwilliger president, is having plans drawn for a brick addition on North Water Street, to cost $40,000.

The Sunbeam Power Co., La Salle, N. Y., subsidiary of the Niagara Falls Power Co., has changed its name to the La Salle Electric Corporation.

The Starling Engine Co., Niagara Street and Auburn Avenue, Buffalo, has been granted building permit for a one-story factory addition to its motor plant.

The Rochester Can Co., 109 Hague Street, Rochester, has awarded contract for a one-story addition, 180 x 200 ft., on Hague Street.

The Atterbury Motor Car Co., Buffalo, has had plans drawn for an addition to its plant at Elmwood and Hertel avenues and the Erie Railroad. J. R. Spraker is general manager.

The Globe Woven Belting Co., Clinton and Faxon streets and the Erie Railroad, Buffalo, has let contract for a brick addition, 50 x 102 ft., to cost $15,000.

The Palmer-Marsey Co., Rochester, will build an addition to its wood-working plant at a cost of $15,000.

The Ogden R. Adams Mfg. Co., Rochester, manufacturer of metal-working machinery, is building an addition to its shops on St. Paul Street.

The Rochester Box & Lumber Co., Rochester, N. Y., has let contract for a planing mill to cost $30,000.

The Pittsburgh, Shawmut & Northern Railway Co. is having plans prepared for additions to its railroad shops at Bolivar, N. Y.

The Eureka Co., Northeast, Pa., is having plans drawn for three additional buildings which it will add to its plant.

Baltimore

BALTIMORE, Nov. 4.

The C. A. Gambrill Mfg. Co., Commerce Street, Baltimore, will build a new reinforced-concrete boiler plant at its works at Ellicott City, Md.

The Baltimore Car & Foundry Co., Baltimore, has commenced the construction of foundations for new machinery to be installed at its plant at Curtis Bay.

The Bartlett-Hayward Co., Scott and McHenry streets, Baltimore, has had plans prepared for a new fuse plant to be operated in connection with its ammunition works. Parker, Thomas & Rice, Union Trust Building, are architects.

The Poole Engineering & Machine Co., Woodberry, Md., has awarded contract to Hicks, Tase & Norris, 106 Madison Street, Baltimore, for the erection of a one-story forge shop, 30 x 105 ft.

In connection with its proposed new shop buildings and yard extensions at Grafton, W. Va., the Baltimore & Ohio Railroad, Baltimore, is planning the construction of a machine shop, wheel pressing works, engine house and other structures.

The Liberty Iron & Wire Co., Norfolk, Va., recently incorporated with $25,000 capital stock, will produce ornamental iron, structural steel, bronze, brass and wire work. The officers are: President, W. A. Farish; vice-president, E. J. Nalls; secretary and treasurer, R. H. Davis; superintendent, C. M. Smith.

Prices on steam pumps are sought by the Fayetteville Ice & Mfg. Co., Fayetteville, N. C.

Stewart & Co., Tatum, S. C., will construct a can manufacturing plant and wants prices on two second-hand 40-hp. steam boilers and 16 to 24-hp. and 8 to 12-hp. engines.

The Woodstock Operating Corporation, Anniston, Ala., wants prices on lifting magnets with electrical generating equipment.

The H. E. Cook Co., machinist and contractor, 28 Light Street, Baltimore, will install 30 hp. in motors at Sharp and West streets.

The Liberty Shipbuilding Co., Wilmington, N. C., has leased the plant of the Cape Fear Machine Works for a foundry extension to its shipbuilding plant. The production of castings at the plant will be used exclusively by the company for ship construction.

The Bureau of Yards and Docks, Navy Department, Washington, is taking bids for three units of new buildings at the Naval Mine Depot at Yorktown, Va. Ten of the structures will be magazine buildings; nine others will be one-story, and five of larger size.

To provide for extensions to his foundry, J. P. Cameron, Graham, Va., has acquired a former rolling mill at West Graham, which will be remodeled as a mold department.

The Southern Truck & Car Corporation, Greensboro, N. C., recently incorporated with a capital of $1,000,000, is planning a new plant for the manufacture of trucks and tractors, with a department for the production of special bodies. The proposed works are estimated to cost about $200,000. J. A. Norfold is president and manager.

The Macon Cooperage Co., Macon, Ga., is planning a new one-story plant, 100 x 140 ft., to replace its works recently damaged by fire. The machinery installation will include equipment for the manufacture of barrel heads, staves, etc., and it is proposed to establish a plant production of about 500 barrels daily. W. A. Roush is president.

The city of Wilmington, N. C., is planning the installation of new pumping machinery with capacity of 5,000,000 gal. per day, steam engine, etc. J. N. Johnston is city engineer.

The Turner-Jennings Motor Co., Roanoke, Va., has been incorporated with a capital of $50,000 to manufacture automobiles and parts. A. R. Jennings is president and T. E. Turner, secretary.

The Hec Mfg. Co., Atlanta, Ga., has acquired a four-story building on Walton Street and will establish a works for the manufacture of metal specialties for kitchen and domestic service. Production will be arranged on an extensive scale to furnish hotels, colleges, hospitals, etc., with metal kitchen equipment.

The Bureau of Yards and Docks, Navy Department, Washington, is planning the erection of an electric power plant at Quantico, Va., to cost $45,000.

The Liberty Iron & Wire Co., McKevitt Building, Norfolk, Va., recently incorporated with a capital of $25,000, will operate a plant for the manufacture of bronze and brass specialties, ornamental iron work and wire products. W. A. Farish is president.

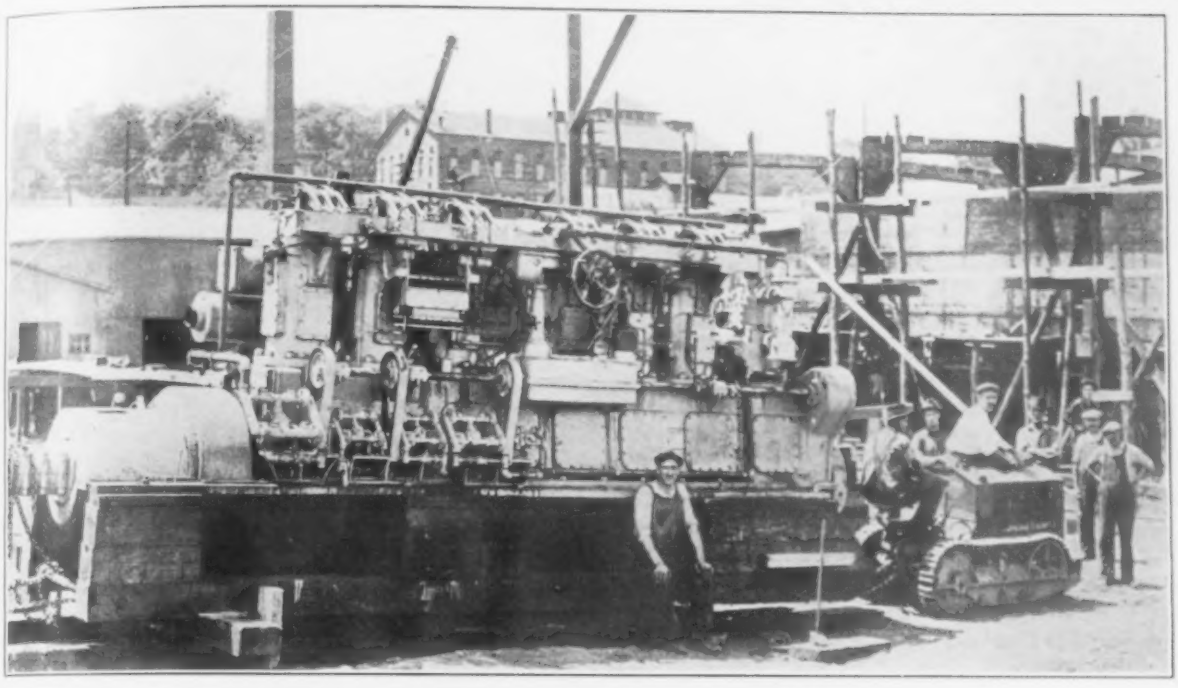
Pittsburgh

PITTSBURGH, Nov. 4.

Pittsburgh machine-tool dealers do not expect any widespread cancellation of machine-tool orders in this territory upon conclusion of peace or an armistice. There are few unfilled orders from companies engaged in munition-making or other similar work which would presumably stop when peace comes, or soon thereafter. Aside from purchases for the Neville Island gun and projectile plant of the Ordnance Department, United States Steel Corporation, there has been very little ordnance buying in this territory recently. Railroads have been fairly large purchasers, but their orders are expected to stand, and in fact there is a belief that railroad business will increase when peace comes, as the complete rehabilitation of American railroads is undoubtedly a part of the program of the United States Railroad Administration, and has been retarded to some extent by the demands of various other Government agencies for machinery for war purposes.

However, nearly all of the leading machine-tool companies here are protecting themselves against cancellations of orders by an iron-clad agreement with buyers to the effect that "this order is not subject to cancellation." Old and favored customers might, of course, be granted an exception to this rule, but in any event machine-tool sellers would insist upon full reimbursement for any work which had been started on equipment ordered and then cancelled.

The coming of peace, with its cancellations of Government contracts, will bring another problem to the machine-tool trade, however, and that is the flood of second-hand machinery which is likely to come into the market. Although it is understood that no action has yet been taken, it would not be surprising to dealers here if the machine-tool builders would be a unit in refusing to sell repair parts for tools to second-hand machinery dealers, but would insist on dealing only with users of the tools. Early in the war when second-hand machinery dealers reaped their harvest,



A Cleveland Tractor Hauling a 27-Ton Diesel Engine from the Freight Yards to the Plant of the Tank-Ship Building Corporation, Newburgh, N. Y. The length of the haul was about ¼ mile, and the engines were handled on greased skids with the aid of triple blocks. The tractor was used also for handling a larger type engine weighing 47 tons. H. E. McConnell, chief engineer of the shipbuilding company, states that this is only one of numerous uses found for it

It was not an uncommon thing for such dealers to send long lists of repair parts to the tool builders, and these orders were, as a rule, filled. The machine-tool builders realized the necessity of doing everything in their power to further Government plans for increased production. In a peace-time market, however, there will be no incentive of patriotism, but purely business considerations will govern. Therefore, it is deemed likely that the machine-tool builders will not sell to second-hand dealers in rebuilding tools which would come into competition with new tools. Many of the tools built for war work are single-purpose machines, and will not be adapted to other than the work for which they were originally intended; at least they will not be of service in the plants in which they are now installed. Moreover, a large percentage of the tools bought for war work have been given unusually hard service, often with inexperienced and careless operators, and some of them will be fit only for scrap.

Whenever possible to do so manufacturers will adapt present equipment to new work. For example, a company in this district which engaged in the forging and rough machining of guns will turn to the making of locomotive tires and will require no changes and practically no additions in equipment. However, such a concern as the Union Switch & Signal Co., Swissvale, Pa., which made a wide departure from its regular line in taking a contract for Liberty airplane motors, will be obliged to make considerable readjustment of equipment in returning to the manufacture of signal systems. Some of the tools recently purchased will be adapted to this line of work, but it is understood that a considerable part of this company's airplane-motor equipment will not be required after the conclusion of its Government contract.

Railroad buying has been the leading feature in this district, though of course the purchases for the Neville Island plant are still of great interest. A statement telegraphed from Washington that the War Department has no intention of curtailing work on this plant was received with satisfaction by the local machine-tool trade, which has a great deal of business pending. The Pennsylvania Railroad Lines West have been buying for the past two weeks for its various shops, and it is reported here that it will also buy from its Philadelphia purchasing office for the new locomotive repair shop at Marietta, Pa. Twenty traveling cranes are included in the requirements for the latter shop. The Union Railroad, a subsidiary of the United States Steel Corporation, has issued a list of about 15 tools for its local locomotive repair shop. A good deal of this repair work was formerly done in the shops of the corporation, but the war pressure has prevented some of late.

The Phoenix Iron Works, Meadville, Pa., is in the market for a crane, 46-ft. span.

The Bryan Machine Shops, Logan, W. Va., wants prices on drill hammers, brass rods, strip brass and copper, large quantities of ½-in. x 2-in. channel irons; lathes about 18-in. x 10-ft., milling machines or gear cutters, cold-rolled shafting, borings, etc.

The Wheeling Iron & Steel Co., Wheeling, W. Va., will construct a car-unloading dock and install a stationary derrick.

The Baltimore & Ohio Railroad Co., Baltimore, is understood to plan the erection of machine shops, a roundhouse and a wheel-pressing plant at Grafton, W. Va.

The Kanawha Collieries Co., National Bank Building, Charleston, W. Va., is seeking prices on power-plant machinery.

The Eagle By-Products Co., Charleston, W. Va., is planning for the erection of an addition to its by-product coal plant to increase the capacity. The extension will cost about $15,000.

The Oldbury Electro Chemical Co., Buffalo Avenue, Niagara Falls, N. Y., has concluded arrangements with the Government for the operation of a new plant at Fairmont, W. Va. It will be used for production for the Chemical Warfare Department, and is estimated to cost $500,000.

Chicago

CHICAGO, Nov. 4.

The placing of orders for adapters is easily the most notable activity in this market and appears to be proceeding at full tilt in spite of the nearing of the end of the war. General activity, and it is all on war account, has been more brisk the past week. One firm placed 76 machines, divided among seven or eight purchasers, everyone of whom is engaged in war work.

The sellers of rebuilt machines, like those who handle new tools, experienced a greater pressure of demand. They are proceeding very slowly in purchasing used tools for renewal, however, as they fear being caught with a large stock for which they paid high prices, and as a result their stocks are lower than they have been at any time since the war started.

The Lawndale Mfg. Co., Elkhart, Ind., will increase its capacity for adapter work at the request of the Government. Another firm figuring on adapters is the George D. Bailey Co., Chicago. These are but two of many so figuring, while several have taken contracts. It is reported that the Government wants 22,000 adapters per day produced in this territory. The Lawson Mfg. Co., Chicago, is figuring on booster cases for shells.

Building in Chicago in October was the quietest of any month in the history of the building department. It dropped 52.41 per cent as compared with October of 1917. There were only seven permits involving $50,000 or more, among the more important of which were a machine shop for the Crane Co. to cost $400,000 and a factory for the W. D. Allen Mfg. Co. to cost $150,000. In this connection, it is noted that

since the organization of the non-war construction bureau in late September, 600 requests for building permits have been received, but only about 10 per cent have been granted. A deduction to be drawn is that a period of greater activity will ensue when war restrictions on building are removed.

M. J. Morehouse, architect, 343 South Dearborn Street, Chicago, has prepared plans for an extension to a foundry at Morris, Ill., for the Western Foundry Co., Chicago.

A building permit has been granted to Charles L. Michod, president Carbo Steel Post Co., 2032 West 110th Place, Chicago, for the construction of a one-story factory, 32 x 180 ft., at 11,024 to 11,038 South Tallman Avenue, Chicago, to cost $3800.

Sub-contracts have been let for a two-story motor truck repair shop 120 x 126 ft., at 114-124 North Carpenter Street, Chicago, for the Sawyer Biscuit Co. It will cost $80,000.

The Chicago Smelting & Refining Co. has purchased the former plant of the Hills, Benedict Linseed Oil Co., in Loomis Street, Chicago. It will be remodeled to meet the requirements of the company and will be occupied about May 1, next.

The Elco Tool Corporation, 720 Sixth Street, Rockford, Ill., has been formed with a capital stock of $28,000 to manufacture garages and small tools. Otto Lundell and Fred P. Shoberg are among the incorporators.

The Jewel Ice Machine Co. was recently incorporated at Quincy, Ill., to manufacture ice-making machinery. Phillip Fischbacker, the designer of the machines, which have capacities up to 25 tons, is one of the incorporators.

The Illinois Foundry & Specialty Co., Morris, Ill., has begun the erection of an addition to its plant.

Clapp, Norstrom & Riley, 61st Street, Chicago, have broken ground for the construction of a new one-story car shop addition to cost about $9,000.

The Interstate Iron & Steel Co., 104 South Michigan Avenue, Chicago, will build a new two-story machine shop, 50 x 100 ft., at 118th Street and the Calumet River, to cost about $25,000.

The Western Foundry Co., Chicago, will soon commence the construction of a one-story foundry addition, 30 x 30 ft., to its plant at Morris, Ill.

The W. D. Allen Mfg. Co., West Lake Street, Chicago, manufacturer of clamps, couplings and related specialties, has filed plans for the erection of its new works at 5632-58 West Twelfth Street, to cost about $150,000.

The Hoefer Mfg. Co., Freeport, Ill., manufacturer of drilling specialties, is having plans prepared for a one-story addition on Chicago Street, 60 x 80 ft., to cost $15,000.

The Amalgamated Machinery Corporation, South Racine Avenue, Chicago, has filed plans for the construction of an addition at its lathe and boring machine plant to cost $75,000.

Detroit

DETROIT, Nov. 4.

Continued demands of munition makers is keeping the machine tool market in an extremely satisfactory condition. Milling machines, grinders and lathes are in special demand. Deliveries are growing slightly better and range from 30 to 60 days.

Detroit is now working on approximately $1,200,000,000 worth of war contracts, according to reports made to the Resources and Conversion Section of the War Advertising Board.

W. J. Baird of the W. J. Baird Machinery Co. is head of the new B. & H. Machine Co., Detroit, which will manufacture screw machine products.

The Russel Motor Axle Co., Detroit, has obtained permission from the Government to erect an addition to its plant. The company is largely engaged on war work.

The Packard Motor Co., Detroit, completed 900 Liberty motors in October, exceeding by 10 per cent. the quota of 825 set by the Aircraft Production Board.

Among Michigan concerns to receive Government orders are: Ford Motor Co., Detroit, tractors; Detroit Twist Drill Co., Detroit, drills; Keeler Brass Co., Grand Rapids, halter squares, belt fasteners; C. A. Spears & Co., Grand Rapids, packing boxes; Lufkin Rule Co., Saginaw, rules; American Cash Register Co., Saginaw, release mechanism control; Industrial Works, Bay City, spares for locomotive cranes.

The Lansing Co., Lansing, Mich., has been awarded an additional Government contract for electric industrial truck trailers of the Reynolds type, which puts the company on a 90 per cent war basis. Under the new contract the company is to supply 400 trailers per week until the demand is supplied.

The Chief Motor Co., Port Huron, Mich., has been awarded a Government contract to build 4000 military truck motors. It expects to have 200 men at work within the next two weeks.

The Hupp Motor Car Corporation, Detroit, which is reported nearing 100 per cent war work, is working on contracts for 500 ¾-ton trucks and 2500 ambulance motors of the standardized Government pattern. It is also turning out finished parts for other manufacturers, including class B truck and tank parts. The company will turn out 9000 automobiles this year, approximately 25 per cent less than the output last year.

The Hill-Curtis Co., Kalamazoo, Mich., has been awarded a large contract by the Navy Department for steam grates.

The Champion Ignition Co., Flint, Mich., has let a contract for the erection of a three-story addition to cost approximately $30,000.

The John Knape Machine Co., Grand Rapids, Mich., has changed its name to the Knape & Vogt Mfg. Co., and has increased its capital and enlarged its capacity. The company manufactures metal specialties.

The Litscher Lite Corporation, Grand Rapids, Mich., has been organized to manufacture lighting systems and will operate in the building formerly occupied by the Michigan Wheel Co. The new concern has acquired a substantial interest in the Monarch Storage Battery Co. and has established selling connections with electrical jobbers throughout the United States. The officers are: President and treasurer, Christopher J. Litscher; vice-president, Fred N. Rowe; secretary and sales manager, W. Russell Patton; directors, Charles J. Kindel and Elmer L. Kinsey.

The Auto Indicator Co., Grand Rapids, Mich., has recently been incorporated for $50,000 to manufacture an automobile indicator. W. W. Huelster is president; I. C. Cilley, vice-president, and Joseph Renihan, secretary and treasurer. V. I. Cilley is general manager. These men, with James Ritzema and Dr. E. O. Cilley, form the board of directors.

The Alpena Industrial Works, Alpena, Mich., will remove shortly to Port Huron, Mich., where a site for a new plant has been acquired. The company manufactures wood-working machinery. L. T. Kline is manager.

The plant of the White Frost Refrigerator Co., Michigan Center, Mich., is reported to have been leased to the Kuenz Radiator Co., Detroit, which also has works in Toledo. The Kuenz concern is reported to have extensive Government orders. The White Frost plant is 65 x 660 ft., and includes a warehouse and power plant. New machinery has been ordered. It is expected to be in operation before December.

The W. M. B. Machine Co., Detroit, has been formed with a capital of $15,000 by Robert Wilde of the Michigan Gear & Engineering Co.; Wakefield R. Meade, Northway Motor & Mfg. Co., and William F. Beach.

J. Shevitz will erect a two-story factory at 193 Ferry Avenue, East, Detroit, for the manufacture of metal parts. It will cost $25,000.

The Grand Rapids Brass Co., Grand Rapids, has taken steps to increase its capital stock $75,000 for the purpose of an enlarged business. The company is working on Government orders at its plants in Grand Rapids and Lansing.

Milwaukee

MILWAUKEE, Nov. 4.

Milling machine business booked by local manufacturers in October showed a considerable increase over the volume for September. The demand continues to come largely from manufacturrs of aircraft motive power in the Middle West and East and is still running into the heavier types of machines. Orders consist mainly of single tool or small lots.

Local machine tool builders have sufficient orders booked to keep running at capacity well into the spring of 1919. There is no semblance of a falling off in new business and no fear exists on account of the latest developments in the direction of peace.

Government contracts awarded the past week to local manufacturers include the following: Sterling Motor Truck Co., 750 class B motor truck chasses; Pressed Steel Tank Co., steel containers, $90,000; Cutler-Hammer Mfg. Co., electric controller panels, $1,185; Barth Mfg. Co., lifting jacks; Pressed Steel Tank Co., gas cylinders; Mechanical Appliance Co., electric motors.

The Milwaukee Electric Railway & Light Co., Public Service Building, Milwaukee, is completing arrangements to proceed with the construction of the first unit of a new steam generating plant on a 250-acre site on Lake Michigan, about 4 miles south of Milwaukee, acquired nearly a year ago. Most of the materials were purchased early this year, but progress was halted pending proper financing of the project. The initial investment in plant and equipment is estimated at approximately $1,000,000. Sylvester B. Way is vice-president and general manager.

...almers Mfg. Co., Milwaukee, has broken ... new pattern storage building, four stories, ... of brick and mill construction. The present ... shop is being used largely for manufac... work is in charge of Klug & Smith, consulting ... contractors, Mack block, Milwaukee.

... Steel Treating Co., Milwaukee, will begin ... on the construction of a one-story brick shop, ... at 619 Thirty-eighth Avenue, West Milwaukee, ... the plant destroyed by fire. G. W. Esau is ... and manager.

... Tractor Mfg. Co., Minneapolis, Minn., has ... the plant erected at Superior, Wis., for the ... Motor Truck Co., and will install equipment for ... of a wheel type farm tractor rated at ... The building is of brick, steel and reinforced con... ft., and cost $50,000. It contains a foundry ... shop and both departments require additional ... It is hoped that the plant will be ready to ... by Dec. 1 or 10. The Stinson company ... authorized capital stock of $500,000, and has been ... a tractor works in Minneapolis for several years. ... are: President, Leslie Stinson, Grand Forks, ... vice-president and general manager, C. H. Stinson, ... secretary and treasurer, F. W. Gleeson, Minne...

... roundhouse and machine shop of the Chicago, ... Minneapolis & Omaha Railroad Co. in the East ... Superior, Wis., were badly damaged by fire last week. ... will be rebuilt at once, the contract having been let ... Peppard & Fulton, Minneapolis and Duluth, Minn.

... Anchor Shipbuilding Corporation, Washburn, Wis., ... recently was incorporated with a capital stock of ..., is progressing with arrangements for the establish... of a four-way steel shipbuilding plant on Chequa... Bay, Washburn, where a 125-acre site has been ... Wildmar B. Nicolysen, Duluth, Minn., is president ... general manager.

... Galland-Henning Mfg. Co., Milwaukee, has post... until spring its plan of building a one-story machine ... addition, 60 x 150 ft., at Twenty-sixth Avenue and ... Boulevard. The estimated cost of the building is ..., exclusive of equipment. The company manufactures ... malting machinery, drums, balers and similar ...

... Industrial Controller Co., 866 Greenbush Street, Mil... manufacturer of electric controlling devices, has ... Henry C. Hengels, architect, First National Bank ..., to prepare plans for a brick and mill shop addi... 90 x 90 ft., costing about $15,000. Charles G. Welch ... president.

... Falls Roller Mills, Sheboygan Falls, Wis., have been ... from William A. Dassow by Capt. Ernest Gonzen... who took possession Nov. 1 and is planning to enlarge ... plant and the hydroelectric installation to engage in ... light and power business. Capt. Gonzenbach ... returned from France and was formerly general ... of the Sheboygan Railway, Power & Light Co., ..., Wis.

... Heating & Power Equipment Co., 130 Sycamore ..., Milwaukee, has increased its capital stock from ... to $50,000 and changed its corporate style to the ... Engineering Co.

... Beloit Dental Burr Mfg. Co., Beloit, Wis., has taken ... contract for small steel parts for the Government, which ... require its capacity for three months.

... Woodford Engineering Co., Barton, Wis., manufac... of electric hoists, conveyors, etc., has broken ground ... a two-story brick and reinforced addition, 40 x 120 ft., ... to cost $25,000. The general contract has been ... Johnson & Drake, Minneapolis, Minn.

... DePere Mfg. Co., DePere, Wis., fabricator and ... of boilers and structural material, will build a one... brick and concrete addition, 90 x 100 ft., to provide ... for handling Government work for the Emergency ... Corporation. The general contract is in charge of ... Beauregard, DePere. A. W. Woodman, Joliet, Ill., is ...

... Hartford Canning Co., Hartford, Wis., has engaged ... Messmer & Brother, architects, 1004 Majestic ..., Milwaukee, to prepare plans for a boiler and ... house, 40 x 40 ft., in connection with its new factory. ... Law is general manager.

... Neenah Brass Foundry Co., Neenah, Wis., has ... the general contract for the erection of a two-story ... and office addition, costing about $20,000, to C. R. ... Sons Co., Oshkosh, Wis. M. H. Hartman is general ...

Cincinnati

CINCINNATI, Nov. 4.

A great deal of interest has been aroused in reports regarding cancellation requests on orders for machine tools. So far these have been largely confined to machine tools for shipyards. The abandoning of the Alameda shipyard project on the Pacific Coast has been the cause of the majority of these requests, although it is stated that an Eastern shipbuilding plant is making an effort to cancel some orders. Machine tool builders are inclined to go slowly in accepting cancellations. Material for manufacturing machines has already been provided, and while the percentage of cancellations is now small, they do not want to establish precedent that might work serious injury. So far, not much is heard from shell makers, but inquiries from these manufacturers have been materially reduced the past week. On the other hand, there is an increasing demand from farm tractor manufacturers for lathes, grinding, and small planing machines.

Building operations in Cincinnati for the month of October were at a low-water mark, the estimated value of improvements totaling only $331,775, the smallest amount reported for any one month in a number of years.

The new addition to the plant of the Lodge & Shipley Machine Tool Co., Cincinnati, will probably be under roof within the next 30 days. The addition will house a special department where mostly female labor will be employed.

The Norwood Sash & Door Co., Norwood, Ohio, has let contract for two one-story frame additions to its plant, 100 x 120 ft. and 100 x 240 ft. respectively.

The Cincinnati Pulley Machinery Co., Covington, Ky., is occupying its new addition which will enable it to increase its production of sensitive drilling machines nearly 50 per cent.

The new plant of the Liberty Machine Tool Co., Hamilton, Ohio, is in full operation.

It is reported that a large storage building will be added to the plant of the National Cash Register Co., Dayton, Ohio.

The addition to the plant of the Dayton Metal Products Co., Dayton, Ohio, has been completed.

It is reported that the Barney & Smith Car Co., Dayton, Ohio, has been commissioned by the United States Railroad Administration to rebuild freight cars. Most of the company's plant has heretofore been engaged in war work.

The Baker Mfg. Co., Dayton, whose incorporation with $10,000 capital stock was recently noted, will manufacture a liquid vending machine. R. H. Baker is one of the principal incorporators.

The Wagner Storage Co., Springfield, Ohio, is erecting a garage and machine shop.

The Armstrong Mfg. Co., Springfield, Ohio, has leased a plant on Liberty Street for the manufacture of underfeed stokers, grates, etc. The company has been using part of the plant for this purpose for nearly three years, but will increase its capacity.

The Loomis-Beardsley Mfg. Co., Columbus, Ohio, has been incorporated with $40,000 capital stock by Ray W. Loomis, Edson Beardsley, and others. It manufactures automobile accessories.

The Thornton Trolley Wheel Co., Ashland, Ky., has been incorporated with $250,000 capital stock by Frederick Thornton, and others.

It is reported that the Jackson Tool & Shovel Works, Montpelier, Ind., will rebuild its plant recently damaged by fire.

Indianapolis

INDIANAPOLIS, Nov. 4.

The Lexington Motors Co., Connersville, Ind., has received a Government contract for 1000 10-ton trailers at $1,344.50 each; the Indiana Truck Corporation for 1500 Class B trucks at $1,162.50 each and the Service Motors Co., Wabash, 750 Class B trucks at $1,187.50.

The Victor Aircraft Corporation, Freeport, L. I., will establish a branch factory in Richmond, Ind., using a part of the Starr Piano Co.'s plant. A testing field for airplanes has been obtained nearby.

A building permit has been taken out by the Big Four Railway Co. at Indianapolis for an extension to the company's roundhouse, to cost $90,000.

The new plant of the Mid-West Engine Co., Indianapolis, now in course of erection, will be used for the manufacture of turbine engines and will cost with equipment about $350,000.

The Swenson Evaporator Co., Angola, Ind., is considering

the erection of a one-story addition, 40 x 100 ft., to cost with equipment about $100,000. Headquarters of the company are at Chicago; M. DeBurs is president.

The Pittsburgh Model Engine Co., Peru, Ind., has begun work on foundations for the two additions to be erected at its works. They will be one-story, 40 x 240 ft. and 30 x 180 ft., respectively, and are estimated to cost $100,000. One of the buildings will be equipped as an assembling department.

The International Lead Co., East Chicago, Ind., is taking bids for the erection of a new boiler plant and pumping station to cost about $20,000.

Cleveland

CLEVELAND, NOV. 4.

Peace prospects have caused some falling off in demand for machinery among manufacturers who might fill in with a few tools but who feel that should the war end within the next few weeks they can get along with the equipment on hand. So far, only one cancellation of any size is reported, which is for punching and shearing machinery for the Liberty plant of the Bethlehem Shipbuilding Corporation, Alameda, Cal., on which work has been stopped. In this case the purchaser will try to find a place in other shipyards for the equipment ordered. While indications point to an early peace, the Government is urging machinery manufacturers not only to show no relaxation in production but to put on additional men and speed up output so that deliveries can be made as promptly as possible. Manufacturers are being advised that there will be no let-up whatever in the Government's war material program until it is positively known that the war is over. The Priorities Committee of the War Industries Board is also checking up manufacturers to see that all shipments are being made to buyers who have priority certificates.

Many manufacturers having Government orders are crowding machinery builders for quick deliveries. There has been an easing up in lathes and radial drills, and quite a few long-standing orders for these machines have been cancelled because buyers are finding that they can secure better deliveries elsewhere. Manufacturers who have recently taken Government orders requiring additional machinery are placing this equipment regardless of a possibility of cancellation of their own orders.

The demand for turret lathes continues heavy, and a local manufacturer reports that the volume of its October business exceeded any previous month this year. Orders for these machines placed the past week include 16 of the largest type for the Erie plant of the American Brake Shoe & Foundry Co. for shell work; 10 for the Holt Mfg. Co., Peoria, Ill.; 11 for the H. H. Franklin Mfg. Co., Syracuse, N. Y., for airplane work; 4 for the Hercules Motor Mfg. Co., Canton, Ohio, which has just taken a Liberty motor contract; 8 for the National Operating Corporation, which is operating the Smith & Weston plant, Springfield, Mass.; 4 for the Pierce-Arrow Co., Buffalo, and 4 for the Spencer Lens Co., Buffalo.

The Wellman-Seaver-Morgan Co., Cleveland, at a special meeting of the stockholders to be held Dec. 2, will act on the proposed increase of $6,300,000 in its capital stock. Under the plan proposed the company will have $3,000,000 in preferred stock and $6,000,000 in common stock. The present preferred stock amounts to only $700,000.

The United Tool & Machine Co., Cleveland, has been incorporated with a capital stock of $25,000 by Frank J. Majek and others.

The National Acme Co., Cleveland, will erect an extension to its Coit Road plant, one-story, 150 x 350 ft., to be used for storage purposes.

The Standard Tool Co., Cleveland, has awarded contract for the erection of a two-story addition, 41 x 52 ft.

The Hoffman Bronze & Aluminum Castings Co., Cleveland, has increased its capital stock from $30,000 to $75,000.

The Austin Co., Cleveland, reports the following new orders for factory buildings: 100 x 128 ft. for the Edgewater Steel Co., Pittsburgh; 60 x 60 ft., Ordnance Engineering Corporation, New York, to be built at Baldwin, L. I.; 53 x 165 ft., Erie Specialty Co., Erie, Pa.; 60 x 120 ft. and 60 x 80 ft., Henry Disston & Sons Co., Tacony, Pa. It has also taken a contract for several buildings for the Rariton River Road Co., South Amboy, N. J., including a machine shop, round house, boiler house and stock house, amounting to $196,000.

The Gramm-Bernstein Co., Lima, Ohio, will enlarge its plant by the erection of a building, 50 x 300 ft., for testing and final assembling purposes. It has taken an additional Government order for 2000 motor trucks.

The Spencer Metal Products Co., Spencer, Ohio, has increased its capital stock from $50,000 to $100,000.

The Otto N. Moore Mfg. Co., Newark, Ohio, has been incorporated with a capital stock of $100,000 by Howard S. Kingsbury, Harry E. Chilcote and others, and will build a new plant. It is announced that it will be operated by a company in Indianapolis bearing the same name.

The Canton Steel Foundry Co., Canton, Ohio, has increased its capital stock from $980,000 to $1,500,000.

St. Louis

ST. LOUIS, Nov. 4.

The Skinner Brothers Mfg. Co., St. Louis, manufacturer of blow pipes and other devices has acquired a new building which is being equipped for increased output.

The Inland Machine Co., St. Louis, manufacturer of piston rings and other devices, has leased additional manufacturing space at 1631 Locust Street. It has three plants in St. Louis.

The Gregory Gin Co., Gregory, Ark., is in the market for about $7,000 worth of additional equipment.

Kyle & Co., Havana, Ark., will equip an electric light plant for municipal and commercial service.

The Dixie Machinery Mfg. Co., St. Louis, has been incorporated with a capital stock of $30,000 by Henry P. Mueller and others.

The Galloway-Kennedy Co., Clarendon, Ark., will install about $30,000 worth of additional woodworking machinery in its lumber plants.

The city of Fayette, Ark., will install an electrically driven pump in its waterworks plant at a cost of about $10,000.

Galena, Mo., will improve its waterworks pumping station equipment at a cost of about $100,000. The engineers are Burns & McDonnell, Kansas City, Mo.

The city of Tulsa, Okla., will install a low-duty centrifugal pump in its waterworks plant.

The Midland Valley Milling Co., Muskogee, Okla., will install about $30,000 worth of new equipment to replace that recently burned.

The Hot Air Gas Stove Co., Little Rock, Ark., has been incorporated with capital of $30,000 to manufacture gas stoves. C. L. Wayman, E. C. Wayman and C. A. Booher are the incorporators.

The first unit of the new Government nitrate plant at Muscle Shoals, near Florence, Ala., has been placed in operation. The works, known as No. 2 Plant, has an annual capacity of 133,000 tons of gunpowder nitrates, and is operated by a total of 186,000-hp., furnished by a local power station and the Alabama Power Co. The plant is in operation 65 days ahead of the schedule time, and will be supplemented at an early date by other units to form the entire works, estimated to cost $30,000,000 complete. The plant was constructed by the Air Nitrates Corporation and will be operated by the Ordnance Department.

The Star Lumber Co., Mobile, Ala., recently incorporated with a capital of $100,000, will build a lumber plant and sawmill at Bay Minette, Ala. Property totaling about 17,000 acres has been acquired. E. J. Buck is secretary and Lynn H. Dinkins, New Orleans, president.

Texas

AUSTIN, Nov. 2.

An issue of $500,000 additional bonds has been voted in the Donna Irrigation district, adjacent to Donna, the proceeds to be used for extending the irrigation canal.

The Prairie Pipe Line Co., Independence, Kan., will equip pumping stations at Cypress, Bryan, Hico and Ranger, along the route of the 12-in. oil pipe line which it is to construct between Ranger and Pelican Island, Galveston. It will also erect several 55,000 bbl. steel storage tanks.

H. Masterton, Houston, and associates will equip an irrigation pumping plant on the Rio Grande River near Brownsville to irrigate 20,000 acres.

The Beaumont Dry Dock & Shipbuilding Co. has just finished the construction of a marine railroad for the Emergency Fleet Corporation at a cost of $135,000. It is also building a dry dock at a cost of about $600,000. Six wooden ships are on the ways, which will be fitted with machinery at the Beaumont yards. J. W. Link is president.

The Compania Mexicana de Combustibles, Tampico, Mexico, is doubling the capacity of its pumping plant at its Tambouoche terminal. When completed the plant will have a capacity of 2000 bbl. of oil per hour.

The Central Power & Service Co., Burkburnet, will construct a steam power plant to provide power for the well drilling outfits in that vicinity. It will also furnish power for operating the municipal waterworks plant.

Machinery & Mfg. Co., Fort Worth, Tex., of oil well machinery, has increased its capital to $100,000. W. A. Bennett is president and manager.

Red River Refining Co., Wichita Falls, Tex., recently organized with a capital of $250,000, will establish a refining plant. A [illegible] line will be installed in connection with drilling [illegible] the company's oil properties.

The Pacific Northwest

SEATTLE, Oct. 29.

The influenza epidemic has seriously crippled a number of manufacturing plants and created a general business depression throughout the city.

Lack of sufficient workmen in shipyards is causing a serious situation, and the opinion prevails that there will be little improvement until advanced wage schedules are announced. Mining work is fairly active, despite the labor shortage.

The Florence Sawmill Co., Florence, Ore., has completed plans for its new mill, the main building of which will be 75 x 145 ft., with engine room and electric plant.

The G. M. Standifer Construction Corporation, Vancouver, Wash., has closed contracts with the Government for 10 wooden steamers, in addition to five steel vessels recently placed. This gives the company contracts totaling $15,000,000.

The Wilcox Lumber & Logging Co., Hylebos, Wash., has been incorporated for $40,000 by W. A. Wilcox, Mathilda Wilcox and Fred Pasha. It is understood that a sawmill will be erected.

The Colby Engineering Co., Portland, Ore., has purchased the Auto-Marine Machine Works and the structural steel plant of the West Coast Steel Co., both in Tacoma, which will be operated under the name of the Colby Steel Engineering Co. Headquarters will be moved from Portland to Tacoma. R. N. Allen, Seattle, is vice-president and supervising engineer. The capacity of the two plants will be doubled.

The Hesse-Martin Iron Works, Portland, has completed plans for a new plant, the main building to be 50 x 100 ft., and to cost $10,000, exclusive of equipment.

The Hallidie Machinery Co., Spokane, is erecting an addition to its plant at North 702 Division Street, and is also building an addition to its boiler house and installing a new 150-hp. boiler.

The Continental Pipe Mfg. Co., Seattle, has received several large orders recently from the Government for wood pipe in the construction of army camps and munition plants.

The British Columbia Sugar Refinery, Vancouver, B. C., is replacing its oil-burning system with a pulverized coal burning plant at a cost of about $150,000. Two 500-hp. Babcock-Wilcox boilers are being installed.

The Wood-Ewing Iron Works, Portland, plans the construction of a new foundry to cost $3,000, exclusive of equipment.

The Pacific Engineering & Equipment Co., Portland, will make extensions to its galvanizing plant to cost $1,500.

The Oregon-Washington Railroad & Navigation Co., Portland, will erect a plate shop at the foot of Meade Street, to cost about $67,000.

The Washington Pipe Foundry Company, Tacoma, will build a dry kiln at a cost of $5,000.

With the contracts for boilers for the Emergency Fleet Corporation the Willamette Iron & Steel Works has a total of 210 boilers under order. The plant has been turning out 12 complete boilers per month and with its present force could build 18, if it could get the necessary steel.

The G. M. Standifer Shipbuilding Co., Portland, has been awarded Government contracts for new ships totaling $16,-000,000. Five steel vessels of 9000 tons each, costing $1,700,-000, are said to be included in the contracts.

It is stated that the United States Shipping Board has recommended the immediate construction of a 10,000-ton floating drydock at Portland.

California

LOS ANGELES, Oct. 29.

The Los Angeles Mfg. Co., 2500 Lenard Street, Los Angeles, manufacturer of riveted steel pipe, tanks, well casing, etc., will build a new plant at Phoenix, Ariz., for the manufacture of sheet iron well casings and related specialties. It recently received a contract for a quantity of well casings for the Salt River Valley Water Users' Association. George Beverly is president and manager.

A new one-story machine shop will be erected by S. Yamamoto, San Pedro, Los Angeles, at 247 Fish Harbor Wharf.

The Federal Mfg. Co., Los Angeles, recently incorporated, has acquired the patent rights to manufacture coil and storage type automatic water heaters, designed by Frank H. Walker, and will occupy a factory at 317-21 West Twelfth Street, formerly the property of Mr. Walker, for the manufacture of such products. Fred W. Forrester is president; O. H. Cope is general manager.

The Big Jim Pump Co., Los Angeles, has been incorporated with a capital of $100,000 to manufacture pumps, etc. L. F. Krekeler, J. M. Lee and R. C. Hoggins, Los Angeles, are the incorporators.

The Bureau of Yards and Docks, Washington, has awarded a contract to George Wagner, 251 Kearny Street, San Francisco, for the erection of an addition to the machine shop at the Mare Island Navy Yard. An extension will also be made to the electric power plant.

The Great Western Canal Co., Butte City, Cal., is planning for the construction of a new electric power plant, with initial capacity of over 100,000-hp.

The San Diego Shipbuilding & Dry Dock Co., San Diego, Cal., is negotiating for property on the tidelands, between Front and Sixth Streets, as a site for a new plant. The proposed works will cost about $100,000 for initial installation, and will be devoted to the production of steel and wooden vessels. Adam Weekler is vice-president and general manager.

The Stop Fire Appliance Co., Los Angeles, has been incorporated with a nominal capital of $6,000, to manufacture fire equipment. P. E. and T. Spellacy, and Thomas C. Murphy, Los Angeles, are the incorporators.

The board of education, San Barbara, Cal., has completed plans for the erection of a machine shop for the new technical and manual training school.

Construction has begun on a new one-story machine shop for the Southwestern Shipbuilding Co., East San Pedro, Los Angeles, as an extension to the present shop.

The Foster Automatic Pump Control Co., Whittier, Cal., has been organized to manufacture pumping equipment. W. L. Foster, 413 South Comstock Avenue, heads the company.

The Fulton Engine Works, Alhambra Avenue, Los Angeles, will build a one-story addition to its machine shop.

The Palmdale Irrigation District, Palmdale, Cal., is considering the installation of new electrically operated pumping plants in the Antelope Valley section. The project is estimated to cost about $500,000.

Plans have been prepared for a new cotton gin, 25 x 100 ft., to be erected by Robert W. Maxwell, Holtville, Cal.

The Dairyman's Machinery & Supply Co., 208 East Ninth Street, Los Angeles, has been organized to manufacture machinery. Antonin Dubuc, 1324 Third Street, Santa Monica, heads the company.

The Los Angeles Shipbuilding Co., Los Angeles, will build a new 10,000 ton dry dock at its plant at Los Angeles Harbor, to be provided with facilities for the construction and repair of vessels.

Canada

TORONTO, Nov. 4.

The C. & J. Hadley Co., Ltd., Chatham, Ont., has been incorporated with a capital stock of $50,000 by Joseph Hadley, George Zakoor, John C. Stewart and others, to manufacture timber, wood products, etc.

The Port Colborne Supply Co., Ltd., Port Colborne, Ont., has been incorporated with a capital stock of $40,000 by Charles E. Steele, Herman H. Ott, Harry Shore and others to manufacture machinery, stoves, electrical apparatus, plumbers' equipment, etc.

The Petrie Mfg. Co., Ltd., Hamilton, Ont., has been incorporated with a capital stock of $2,000,000 by Alexander B. Petrie, Guelph, Ont.; George R. and Harold J. Petrie, Hamilton, and others to manufacture machinery, implements, tools, equipment, etc.

The Consolidated Tool & Machine Co., Ltd., Brantford, Ont., has been incorporated with a capital stock of $500,000 by Willoughby S. Brewster, George D. Heyd and others to manufacture machinery, machine supplies, tools, shells, etc.

Fire which started in the bending room of the Canada Carriage Works, Brockville, Ont., from spontaneous combustion on Oct. 27, completely destroyed the building together with the blacksmith, gear shop and other shops. The loss will amount to $500,000.

The Beach Foundry Co., Ottawa, Ont., has started work on an addition to its plant to cost $75,000.

The City Commissioners, Montreal, are contemplating the electrification of half of its pumping station. The cost of making the change from coal to electric power will be about $150,000.

Mark Rogers, Parry Sound, Ont., is in the market for a 6-roller, 4-side planer; also 4-in. band re-saw.

The Dominion Government has contracted with the Wallace Shipbuilding Co., Vancouver, B. C., for two ships of 5100 tons capacity and one of 4300 tons. The Kingston Steamship Co., Kingston, Ont., will also build one of 3750 tons; and the Port Arthur Shipbuilding Co., Port Arthur, Ont., will construct two of 3400 tons.

Work is under way on an addition to the plant of the Rands Iron Works, Vancouver, B. C., including a furnace room to cost $3,500.

The Canadian Car & Foundry Co., Ltd., 1213 Laughton Avenue, Fort William, Ont., will erect another building in connection with its plant, and will also start work shortly enclosing its shipbuilding sheds.

The International Castings Co., Ltd., Sandwich, Ont., will shortly commence the erection of a foundry to cost about $40,000.

Work is under way on the erection of a plant at Lachine, Que., for the Crane Co., 836 South Michigan Street, Chicago, to cost $600,000.

The erection of a machine shop for the Tidewater Shipbuilding Co., Ltd., Three Rivers, Que., has been started and will be rushed to completion. It will cost $15,000.

Government Purchases

WASHINGTON, Nov. 4.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, at an early date under schedules as follows: Schedule 6677½, San Francisco, machine tools, including 1 grinder, 1 drilling hammer, 1 power press and 1 sander; 6754½, Norfolk, 1 drilling machine; 6770½, Philadelphia, 1 squaring shear; 6783½, Washington, 1 sensititve drill; 6784½, Newport, machine tools, including 2 lathes and 2 bench tools; 6785½, Norfolk, 1 bench lathe; 6786½, Washington, 2 precision lathes; 6788½, Washington, 2 sensitive drills; 6787½, Key West, 1 2-wheel grinder; 6795½, for eastern and western yards, crane trucks and storage batteries; 6802½, Washington, 1 metal forming machine and 1 punch and shear; 6803½, Washington, 1 bench grinder; 6807½, Boston, 25-horse power motors; 6810½, Brooklyn, machine tools, including 1 brake and folder, 1 forming machine and 1 slitting shears; 6814½, Norfolk, 1 ball-bearing wood shaper; 6818½, Brooklyn, 2 band saw setting and sharpening machines; 6822½, Washington, 8 vertical drills; 6839½, Mare Island, 72 electric portable drills; 6840½, Newport, 1 head drill; 6841½, Philadelphia, 1 generating outfit; 6851½, Brooklyn, 10 chain hoists; 6876½, Mare Island, 1 hydraulic pump; 6878½, Washington, 2 motor generator sets; 6879½, Brooklyn, 4 turbo generating sets; 6883½, Boston, 65 tables and under-drivers, 13 1-horsepower motors and 85 sewing machines; 6885½, Boston, wiring, grooving, shearing and turning machine; 6891½, Boston, 2 electric hoists.

The Bureau of Yards and Docks, Navy Department, Washington, is preparing specifications as follows: Specification 3167, Bay Shore, Long Island, 2 steam-driven electric generators; 3180, Philadelphia, four boilers; 3213, Philadelphia, fire hose, mains and air connections in machinery and electrical shop; 3240, Mare Island, electric traveling crane for structural shop; 3300, Hampton Roads, coal-handling machinery; 3328, Hampton Roads, mechanical equipment; 3345, Philadelphia, machinery and electric shop; 3372, Bellevue, D. C., electric crane; 3389, Pensacola, Fla., power plant improvements; 3240, Philadelphia, structural shop, smithery, machine and electric shop; 3424, Islamorado, Fla., refueling station; 3438, New York, electric traveling crane in structural shop; 3458, Great Lakes, Ill., power house; 3477, Boston, electric traveling crane for extension to machine shop and foundry building No. 2; 3478, Philadelphia, pattern shop; 3486, Nantes, N. C., refueling station; 3487, Assateague, Va., refueling station; 3497, South Brooklyn, N. Y., locomotive house, bids to be opened at yard; 3502, Portsmouth, N. H., 2 cranes for machine-shop extension; 3503, Ward's Island, N. Y., stokers for power house, bids to be opened at yard; 3533, Boston, mechanical equipment and piping in boiler plant; 3576, Philadelphia, coal and ash-handling plant; 3585, Hampton Roads, boiler house; 3586, Norfolk and Philadelphia, mechanical stokers; 3589, Portsmouth, extension to machine shop; 3607, New York, coal and ash-handling equipment; 3609, New York, 2 traveling cranes for machine shop and electric shop; 3612, Chatham, Mass., boiler house.

NEW TRADE PUBLICATIONS

Compressed Air Separator.—Griscom-Russell Co., 90 West Street, New York. Bulletin No. 1110. Gives a brief description of the construction and method of installation of a separator for removing water vapor from compressed air. The necessity for eliminating water from compressed air before it is used is pointed out and views showing the different arrangements of separator that can be supplied to meet the demands of special piping are presented. A table of approximate dimensions and a partial list of users are included.

Mechanical Counters.—C. J. Root Co., Bristol, Conn. Catalog. Treats of a line of mechanical counters for use to count or measure materials as they are manufactured, wrapped, packed or conveyed, registering the revolution or strokes of pumps, engines, dynamos, shafts, etc., and keeping track of hand operations where a count is required. The different types of counters are illustrated and are also shown in use on machines. In connection with the views of counters in use, data on the work performed are included.

Portable Floor Cranes and Hoists.—Canton Foundry & Machine Co., Canton, Ohio. Pamphlet. Concerned with a line of portable cranes and hoists for picking up work and carrying it to parts of a shop which cannot be reached by ordinary shop transportation appliances. After a brief description of the construction and operation of the hoist the different sizes that can be supplied are illustrated and condensed tables of specifications presented. A number of views of the hoist in use are included.

Pipe Couplings.—S. R. Dresser Mfg. Co., Bradford, Pa. Catalog. Size, 7½ x 10 in.; pages, 111. Concerned with a line of steel pipe couplings, sleeves, clamps, fittings and other standard accessories for the construction, maintenance and operation of oil, gas, air and water lines of wrought and cast-iron pipe. The various couplings and fittings are illustrated and briefly described with tables of the different sizes of each that can be furnished and a number of views showing various manufacturing operations being performed in the plant are included. Illustrations of the fittings in use are also presented and an alphabetical index of the products covered is included.

Moving Coil Galvanometers.—Leeds & Northrup Co., 4901 Stenton Avenue, Philadelphia. Catalog No. 20. Presents a description of the moving coil galvanometer and its uses in scientific research and technical industries. Illustrations and descriptions of the various forms in which the galvanometer can be supplied complete the catalog.

Standardized Industrial Buildings.—Austin Co., Cleveland. Book of buildings No. 5. Covers the various forms of standardized industrial buildings which can be supplied, the text being supplemented by numerous detail drawings and specifications. Views of a number of construction operations are included.

Factories.—Woodbine Board of Trade, Woodbine, N. J. Pamphlet. Illustrates a number of factories of various sizes which are available for new industries. All of the buildings are of the so-called slow-burning construction and are equipped with steam heat, electric light and power, elevators, etc.

Drill Grinding Machines.—Grand Rapids Machine Co., Grand Rapids, Mich. Catalog. Describes and illustrates a line of grinding machines for twist drills. The conditions required for a perfect working twist drill and the reasons therefor are presented, followed by a description of the construction of the machine, the text of the latter being supplemented by numerous line engravings. This is followed by illustrations and condensed specification tables of different machines that can be supplied, a separate page being devoted to each. Considerable useful information on the care and use of twist drills is included.

Sand Blast Equipment.—Pangborn Corporation, Hagerstown, Md. Bulletin No. 50. Presents the principles of and data of sand blasting. The process of sand blasting is concisely described and the two systems employed, the direct pressure and the suction, are briefly defined. Information on air compressors, abrasives, sand blast rooms and their ventilation and dust arresters is presented, together with a number of illustrations of typical work handled by the various forms of sand blast apparatus.

Lock Washers.—Reliance Mfg. Co., Massillon, Ohio. Catalog No. 4. Relates to a line of lock washers which are made in a number of different styles. A separate page of the catalog is given to each type with illustrations of the plain and positive patterns of washers and tables giving the various sizes that can be supplied. A table of decimal and millimeter equivalents of fractional parts of an inch is presented and a complete telegraph code for ordering is included.